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THE SPHERE

Vol. CLXII No. 2123 WITH WHICH IS INCORPORATED THE GRAPHIC SEPTEMBER 28 1940

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MINISTRY OF FOOD

THE WEEK'S FOOD FACTS No. 9

Remember to turn on the Wireless at 8.15 every morning.

"AN army marches on its stomach." In this war, where every kitchen i in the front line, we *all* march on our stomachs

Today science offers to help us to victory the kitchen front. Everyone knows that cer foods are needed for energy and for bo building. But do you realise that other fo (rich in vitamins and mineral salts) are essential for *protec us from illness?* Below there is a list of these 'medici foods, which science calls the *protective* foods. Read o you want to know what to eat for health.

ON THE KITCHEN FRONT

CHIEF PROTECTIVE FOODS

Milk	Potatoes
Butter or Margarine	Green Vegetables (fresh or canned but not dried)
Cheese	Salads
Eggs	Fruit (fresh or canned but not dried)
Herrings (fresh, canned or salt)	Carrots
Salmon (fresh or canned)	Tomatoes
Liver	Wholemeal Bread

TWO WAYS OF PRESERVING TOMATOES.

Tomato Puree. Wash the tomatoes and cut in quarters; heat in a covered saucepan until they are quite soft. A quarter-ounce of salt and a quarter-ounce of sugar to each two pounds of tomatoes may be added if desired. Rub the pulp through a sieve. Return it to the pan and reheat. Pour immediately into clean *hot* jars and seal either with mutton fat, or with three or four rounds of thin paper brushed with home-made paste and pressed down firmly one on top of the other over the neck of each jar.

Skinned whole Tomatoes in E Blanch the tomatoes in boiling w for about half-a-minute; then p cold water. Peel the tomatoes pack in screw-band or clip-top Cover with brine made from hal ounce of salt to one quart of w A very little sugar (about a quart an ounce) may be added to the b if desired. Sterilize in the same as for bottled fruit, but raise temperature to 190° F. in 1½ h and maintain this temperature 30 minutes.

SWEDES AND TURNIPS EN CASSERO

Don't always eat your swedes turnips with meat. They are excel food and make a satisfying cours themselves. Peel 2 lbs. of swede turnips and cut them into fairly l pieces. Fry lightly and place ther a hot casserole with a well-fitting Season well and just cover with st Put on the lid and cook in a mode oven for about 1 hour, or until ten Sprinkle the dish with chop parsley before serving it.

THE MINISTRY OF FOOD, LONDON, S.W

THE SPHERE
With which is incorporated "THE GRAPHIC"
The Empire's Illustrated Weekly
London, September 28, 1940

THE KING AND QUEEN ON THEIR CEASELESS VISITS TO RAIDED AREAS

A Chat with a West London Resident Rescued from an Anderson Shelter

Their Majesties have been untiring in their visits to devastated areas during the past week. After the big raid on Western London last week they chatted with Mrs. Eals, whose house was bombed, although she herself had escaped unhurt in her Anderson shelter. The King and Queen later went down to the London Hospital, one of many such buildings selected as targets by the German bombers. They chatted with the East End folk and with the nurses and members of the staff rendered homeless by the bomb and fire damage. The East Enders, too, who have been moved down to Windsor also received a visit from Her Majesty. Never has she looked, or been, more charming than on these recent visits to the front line

Postage—Inland, 2d.; Canada and Newfoundland, 1½d.; Elsewhere Abroad, 2d.

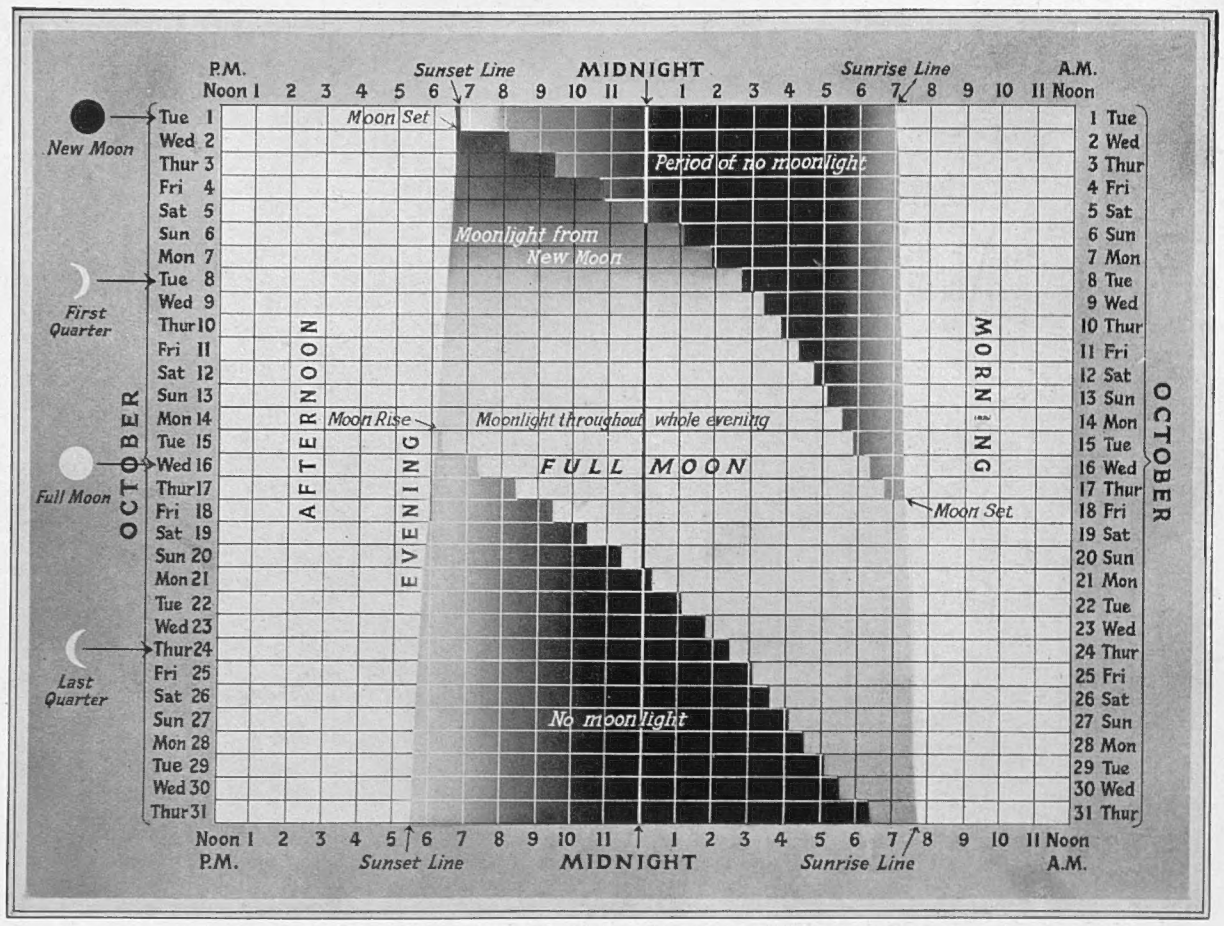
A WAR NEWSLETTER —No. 56

32–34, ST. BRIDE STREET, E.C.4

LOST GEMS.—By the fortune of war, despite every precaution, the "copy" of one of my Newsletters went astray, and came to hand too late for the printer's usual, careful offices. It is worth mentioning that this is the first of 700 continuous weekly letters that has gone awry—a tribute to the Post Office, to the Illustrated Newspapers and, if you please, to the writer. What gems the reader lost I do not at the time of writing know. There was matter, gay and grim, which I was at pains to write and regret that you may not read. Much of it was tribute to Londoners and the inhabitants of our big cities and to our even more glorious airmen, who have, all of them, exhausted our superlatives and reduced us to simple words. They and all the nation are doing their duty and that is the highest praise we can bestow on Britons to-day—the Order of Merit broadcast over the land we love and defend.

THE REICH-MARSHAL ON THE CLIFFS.—"During the daytime he watches through binoculars the effect of his air bombardment. In the evening he confers decorations on the airmen who bring home the tallest stories." I like that picture of Göring. Day and night, he pursues a will-o'-the-wisp. He sees what it suits him to see and what is not there; and he rewards services which are as ineffective as shameful. For him his leader reserved the Order of Herod (1st class, with wings). There is a vacant space for it on his rump. That bloated, evil bag of vanity, tricked out in stars and tinsel, reposes on the French cliffs and every day a little more of the gas leaks out from him, and every day the skin crinkles a little more round his gross cheeks and belly. He has bombed the Queen, and hoped to crack the fabric of St. Paul's; he has destroyed some century-old churches and killed or made homeless scores of thousands of poor people. But he has not even begun to crack the spirit of Londoners or the race of Britain. Every bomb he has dropped has strengthened the foundations and fabric of our resistance, every death he has caused has shaken the Nazi edifice. His relentless sword is a hat-pin which pricks his own skin. And now once more he must call in Goebbels and have recourse to more and more bloodcurdling threats.

FACING FACTS AND THE WINTER.—The concentrated bombing of London and the imminent expectation of invasion kept us for a fortnight too much pre-occupied to consider the larger aspects of the War of Britain. The equinox brought the expected—though comparatively modified—lull, and a few spokesmen, more or less authoritative, began to deal with that larger aspect again and to set right the public sense of proportion. The experience of the first gale and low cloud and heavy rain taught most people a lesson unpleasantly new to many of them. For modern bombers there appears to be—at any rate until snow and sharp frost come in the latter end of December—no sort of weather impossible or even unsuitable for night operations. Our own and the enemy's bombers can and will cross every night whatever the weather this side of January. We must expect that long and persistent buzzing over our chimney-stacks every night for the rest of the year. We have been told by experts that in the Government's opinion the Nazis are not now strong enough to bomb in mass formation more than one or two big objectives at one time. But when London was getting the brunt, rural areas in the East and South were continuously aware of the attack.



"THE SPHERE'S" MOONLIGHT CHART FOR THE MONTH OF OCTOBER

The hours of effective moonlight are lengthening as autumn is entered. There is a thin crescent moon between 7 and 9.30 p.m. on Thursday the 3rd of the month. From then onwards there will be increasing moonlight from the beginning of each evening till about 6.30 a.m. is reached. On the 14th, 15th and 16th there will be a maximum amount of moonlight practically throughout the whole night. On and after the 17th the moon begins to appear after a period of darkness, and rises about an hour later each evening. On the 20th it rises about 11.30 p.m. By the 25th the moon is waning fast. It does not rise till just after 3 a.m. By the 29th and 30th another moon has come and gone

A limited number of these charts will be supplied free of charge on application to the Publisher, "The Sphere," 32–34, St. Bride Street, London, E.C.4, but 2½d. in stamps must be enclosed with the application

BOMBER "LANES."—What happens is that groups of Nazi bombers set forth from many points in occupied territory and are given a beam along which they follow a course to London from different compass points. These "lanes" are many, from East Anglia to Dorset, and converge on the capital. We have certain means of deflecting these given beams or set courses by which the bombers fly, but these efforts merely serve to increase the radius of the enemy's overhead travelling and to increase the extent of the night buzzing over country areas. Most people are getting used to it, and used to the idea that sudden death may come any moment of the night. Yet even the Nazis must exercise a certain economy, for bombs cost money and use up vital material, and we more or less realise that bombs will not be dropped on country districts, well known to be non-military and sparsely populated, unless the enemy bomber is trying for a searchlight or unloading before a crash or during an attack. At the same time such unloadings appear to be on the increase. My own village is ringed and pitted with bombs, of which perhaps one in twenty has caused a very little damage. So the rural population accepts the risks and ignores the buzzing with more or less philosophy. In any case garden shelters in rural areas are not practicable in the small hours of a wet, cold night. We prefer our beds, and if the bombs do begin to fall close it is too late to make a move from our bedrooms. In such rural areas shelters are only useful in day time when air fights are going on immediately overhead, and even then the roof of a house offers adequate protection against the minor risks of fragments and bullets. Looking, therefore, no farther than the end of 1940, we accept it that every day and night most of England, rural and urban, will continue to exist in the reserve or front-line trenches, continually under the shadow of death, less or more remote. The great cities may expect to bear the brunt, but not all will suffer at the same time, and the country districts will share the nuisance of being bomber thoroughfares according to the city objectives. The city air-raid technique and shelters will constantly improve, and presumably we shall carry on as Barcelona did, and as long or longer. Meanwhile, we accept the policy of the Government as right—to continue to strike first at the preparations for invasion and next at the vitals of Nazi war output, especially plane reserves, plane factories, and petrol stores, and we accept the assurance that the wearing-down process is progressing and that the Nazi air superiority is gradually growing less. We are assured that air initiative is being slowly wrested from the Nazis and that signs are clearly to be observed that it is so. But we have very little idea of what proportion of the Nazi air forces has yet been employed against us.

THE WIND AND THE RAIN.—Heigh ho! the wind and the rain. Say rather ho! ho! I never welcomed rain more, never felt more tolerant of whirling leaves and back draughts. Every day that is bad flying weather is a confessed comfort to all but the unutterably robust or the complete deceiver. We get used to air-raid warnings, we carry on under the nuisance, but it is a pleasant change to look up at the sky, a wild September sky, as to a trusty friend which, though bluff and over-hearty, holds no hidden treachery. Pleasant, too, to be lulled to sleep by the marching of wind in the tree-tops instead of that intermittent buzzing sound which denotes a three-engined bomber, for ever circling round our own particular chimney-stack (and probably in truth five miles away all the time). Is this a confession of weakness? No, the truth (but *is* it truth?) is never weak. No one cares for enemy planes overhead, not even Berliners. And if we stand the affliction with patience and with humour, we are doing our jobs as good citizen-soldiers. As for the rain, no gardeneror farmer can have too much of it for many days to come. We have suffered the longest series of droughts in my experience and are heartily weary of the blue sky.

EQUINOX.—During the night of the full-moon—one of the authoritative, definitive dates for the invasion of Britain—the Equinox made its presence felt with a notable gale from the west. It whipped up the waters of the Channel to a nasty, choppy sea in which E-boats and barges would have been too unhappy to do their jobs; and men at the outposts knew that invasion was unlikely during their tour of duty that night. But the low cloud scud and the strong wind did *not* provide a quiet night in the sky. Oddly enough, in my rural area, there was more persistent enemy night-flying on the 16th between 9 and 11 p.m. than for days past. Few, if any, bombs were dropped within radius of hearing, and the nuisance value was purely nuisance. It gave me the impression that Nazi novices were trying their wings at night flying—doing what we did over Germany last autumn. I fancy we must accept it that nowadays there are not likely to be many non-flying days or nights throughout the autumn and winter. It is all very different from conditions in the last war. It is probably for the best. Man can become inured to anything, and short reliefs imply sharp contrasts and new bracing-up of nerves when the imbecile business begins again. On the whole, I would rather the business went on non-stop.

RUMOURS AND TRUTH.—Among the more curious rumours of this war was the very confident report from an American correspondent that a Nazi expeditionary force set out last week from a Western French port to effect a landing on the West Coast of England. It was vaguely suggested that the armada sailed out to sea and then, deciding that the adventure was "sheer suicide," turned back again. It was, therefore, a rather flimsy rumour, lacking details and colour—a confident assertion of a fact supported by no circumstantial evidence at all. Needless to say, rumours of attempted invasion kept the defences on the alert last week. There is no harm in that—indeed, it is inevitable—so long as essential work is not interrupted. That the adventure is desperate, if not "sheer suicide," I firmly believe, but we believe no less firmly that Hitler will and must try it, if conditions offer the smallest prospect of a concealed start and a hopeful beginning. Nevertheless, so far as my own small responsibility runs, I shall bear in mind the importance of "getting the cows milked" and ensuring that all other essential work is continued until the last minute. My experience of war shows that even *blitzkriegs* develop rather slower than the novice may suppose. There is a lot of waiting at the cross-roads; and the cowman in his uniform can best employ his waiting hour milking at the farm instead of smoking at the road block. We can finish the game of bowls *and* beat the Dons.

THE OLD STAGER

THE NIGHT-BOMBER WHICH HAS BEEN CARRYING OUT THE RECENT LONG-DISTANCE ATTACKS ON ITALY

This is the huge Whitley twin-engined bomber which has recently been used for flights of 1,600 miles, high over the Alps, to bomb the aircraft factories and other military objectives in Northern Italy. The latest of this type have two Rolls-Royce Merlin engines—but all performance details are secret. Normally there is a crew of five—pilot, second pilot (who is also the navigator), front-gunner bomb-aimer, wireless-operator and rear-gunner. The "defensive" armament is housed in big power-operated gun-turrets in both nose and tail. For the moment, long-distance raids over the enemy's territory have not been so numerous, as the R.A.F. have been concentrating on the "invasion" fleet of the Germans along the French coast; but when these operations are at an end, it is not unlikely that we will hear of a very great extension of our policy of attack. We might then hear more of the enemy's power of resistance and of the *morale* of the civilian population of Germany!

THESE ARE THE SHELLS WHICH NIGHTLY FILL THE SKY OVER LONDON

During the recent all-night raids over London the barrage of anti-aircraft shells has grown fiercer and fiercer. This picture shows only one of the many types of shell which Nazi pilots have come to fear. They *do* look fearsome, don't they? The officer in command of the battery is seen in the above picture checking over his ammunition in readiness for the night's efforts: note the size of the charge of these shells, in comparison with the actual projectile itself

WAR-TIME ACTIVITIES IN BRITAIN:

NO TIME IS LOST AFTER AN AIR RAID: Almost as soon as the "all clear" is sounded, squads of men set out to repair the damage caused by the bombs. This picture, taken in a suburban street, shows a body of workmen effecting repairs to the broken windows of a row of houses: more permanent repairs will be undertaken by competent building specialists later

H.M.S "STURGEON" RETURNS HOME AFTER SINKING A 10,000-TON GERMAN TRANSPORT: THE COMMANDER, LIEUT. G. D. A. GREGORY, D.S.O., IS ON THE EXTREME RIGHT

THE CREW OF THE SUBMARINE "STURGEON" ON THEIR SAFE RETURN TO PORT AFTER GREAT ADVENTURE IN GERMAN WATERS IN THE SKAGERRAK

The *Sturgeon* is a submarine of 640 tons, armed with six torpedo tubes and a 3-in. gun. She was launched at Chatham eight years ago. *Sturgeon* has now returned to her base after a most brilliant exploit in bad weather in the Skagerrak: during her patrol she encountered a heavily-guarded enemy transport of 10,000 tons which was carrying some 3,000 troops. Conditions were not good; nevertheless *Sturgeon* carried out a most successful attack. The vessel was sunk, and Danish reports have stated that many of the troops on board were drowned. These two pictures were taken just after the return of the submarine to her home base

BUSINESS STILL GOES ON IN OXFORD STREET: Despite the air-raid damage in Oxford Street, most of the big establishments were open and doing business shortly after the bombing. At one of the more severely damaged establishments, an open-air office was set up; here orders were taken from customers and the life of the Store was carried on whilst the premises were being "renovated"

A GERMAN PILOT RESCUED FROM THE SEA BY A BRITISH OFFICER: When his machine was shot down into the sea by R.A.F. fighters, this pilot of a Messerschmitt 109 was rescued off Folkestone by 2nd Lieutenant M. E. Jacobs of the Royal Engineers. The pilot had a broken arm and leg, and was only kept afloat by his life-jacket. Lieutenant Jacobs plunged off the pier and, together with a sapper and a lance-corporal, swam 300 yards to reach the pilot. He was then lifted into a fishing smack and brought ashore. In the above picture Lieutenant Jacobs is the barefooted figure (in corporal's overcoat)

"Business as Usual" After the Raids; The Return of H.M.S. "Sturgeon"; The Capture of German Airmen; And Other Pictures of the Week

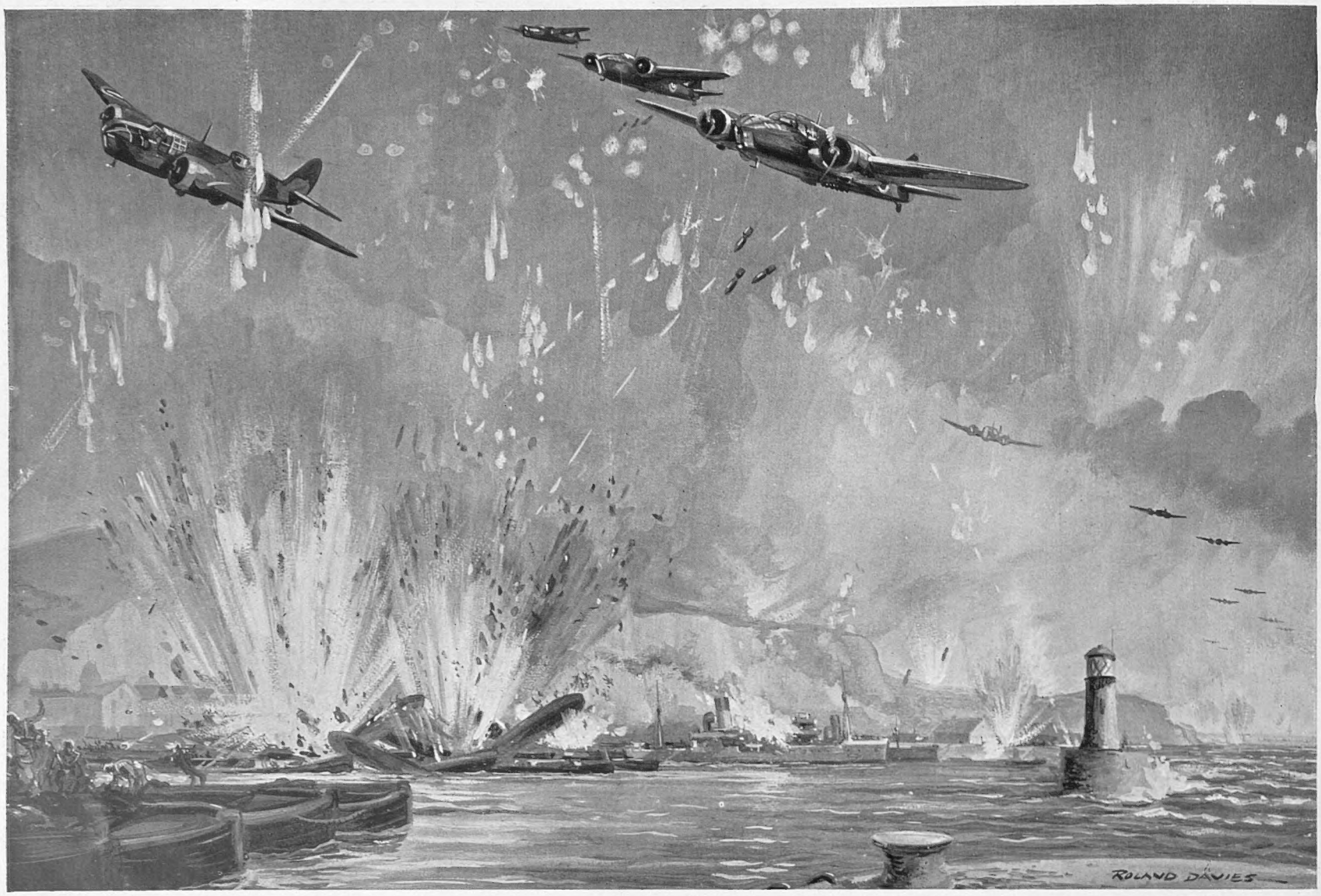
WATCHING A DOG-FIGHT ON THE SOUTH-EAST COAST: This cheerful band of Jack Tars were proceeding on leave from the Coast when the enemy came over in force. The resultant dog-fight engaged the attention of all for the next few crowded minutes

SMART WOMEN OFFICERS OF THE AUXILIARY AIR FORCE: These women are the "Code and Cypher Officers" of the Women's Auxiliary Air Force. They were reviewed a few days ago by Air Commandant Trefusis Forbes, Director of the Force, at an establishment near London, where the above picture was taken as they marched on to the parade ground

WHAT HAPPENS WHEN GERMAN PILOTS ARE BROUGHT DOWN OVER BRITAIN: First of all, they are given boxes containing civilian gas-respirators, so that if their comrades decide to use gas over Britain they will be as safe as the rest of us! It will be remembered that in the last war, in defiance of International Law, the enemy did not hesitate to make use of this terrible method of attack

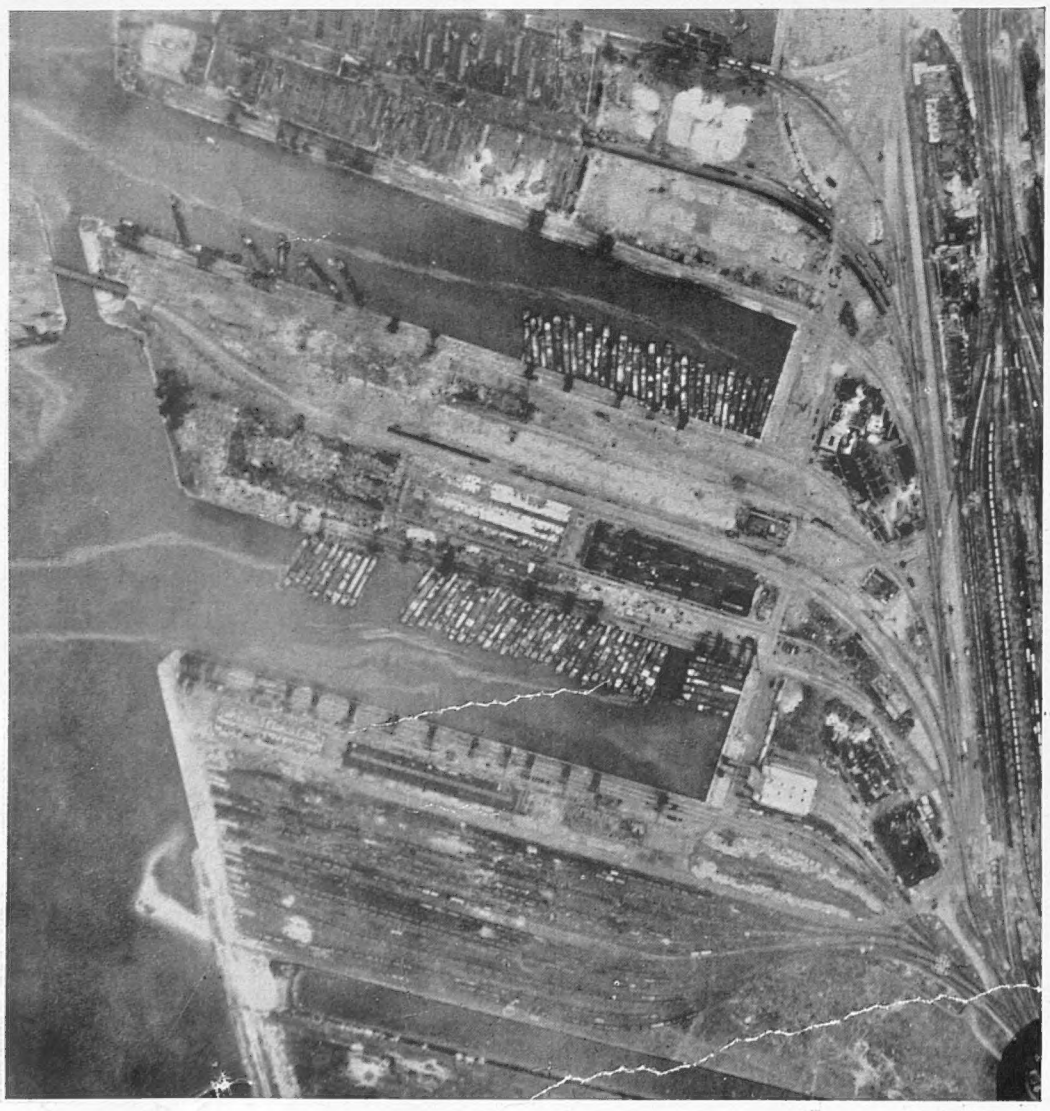
ANOTHER VESSEL ADDED TO BRITAIN'S EVER-GROWING MERCHANT FLEET: British shipyard workers are engaged day and night building the ships which have been specially designed for war-time conditions. To-day, these vessels in ever increasing numbers are being launched with a minimum of fuss: the elaborate launching ceremonies of pre-war days are now dispensed with — there is no launching platform, no christening with champagne and no cheering crowds. Now, when all is ready, and the last blocks are knocked away, a whistle is blown, an axe falls on a cord, and the ship slides down the slipway, watched only by a handful of men necessary for the successful launching. Directly the ship is safely launched, the slipway is prepared for the next ship

THE CONVOYS STILL COME THROUGH SAFELY: Despite all that we have heard during the past weeks and months of the "German blockade of Britain," the Convoys are still coming into port. This picture was taken only a few days ago from the deck of one of the escort vessels — proof of the effectiveness of the alleged "blockade." Note the balloon flown from the deck of one of the vessels as a protection against dive-bombing attacks from the air



TWIN-ENGINED BLENHEIM BOMBERS HAND OUT SEVERE PUNISHMENT TO GERMAN INVASION CONCENTRATIONS ALONG THE FRENCH COAST—*Drawing by Roland Davies*

For weeks now the R.A.F. have been battering at the French Channel ports held by the Germans. Every night, as German bombers come over England, our bombers are swarming over the enemy's concentrations of ships, barges and stores, battering away at the "Invasion" fleets. Extensive damage has already been done, several of the British raiders not hesitating to come down to 1,000 ft. and lower for greater precision in their bombing. It has been reported that hundreds of German soldiers have been killed in these aerial bombardments; but even more important than this is the vast damage to the equipment which the enemy has so laboriously stored for his attack on this country



BOMBING THE BARGES AT DUNKIRK—Part of the Dock Area, Showing Concentrations of Flat-Bottomed Boats Bombed By the R.A.F.: The large and small pictures reproduced here should prove of the very greatest interest at the present moment. The smaller picture (*on the right, above*) shows part of the dock area at Dunkirk taken some time after the evacuation of the B.E.F. The larger picture shows the same area last week end, after part of the "Invasion" fleet had been concentrated at this point. Dock buildings round the upper of the two docks have been completely destroyed, and the unloading cranes and haulage gear smashed. Two big warehouses facing the other dock have been demolished, and the one in the centre gutted by fire. Wharves, roads and railway sidings are pitted by bomb craters from the repeated attacks by R.A.F. bombers. Damaged barges can be seen near the entrance to the upper dock, where a number are known to have been sunk. This is the reason that, so far, Berlin has not been bombed as thoroughly as London—the R.A.F. will deal with this matter later on, after the "Invasion" fleet has been dealt with

DUNKIRK AFTER THE EVACUATION OF THE B.E.F.: The "dead" port, before the Germans began to concentrate for invasion
—Compare this picture with the one on the left

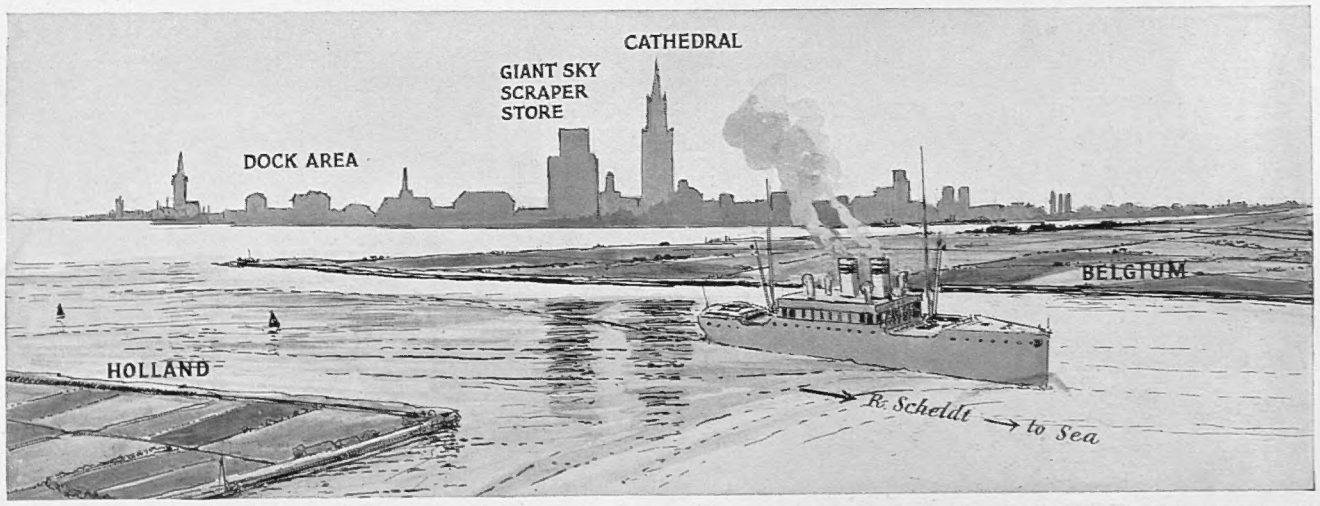
BRITAIN HITS BACK HARD

The "Invasion" Ports get a Battering at the Hands of the R.A.F.

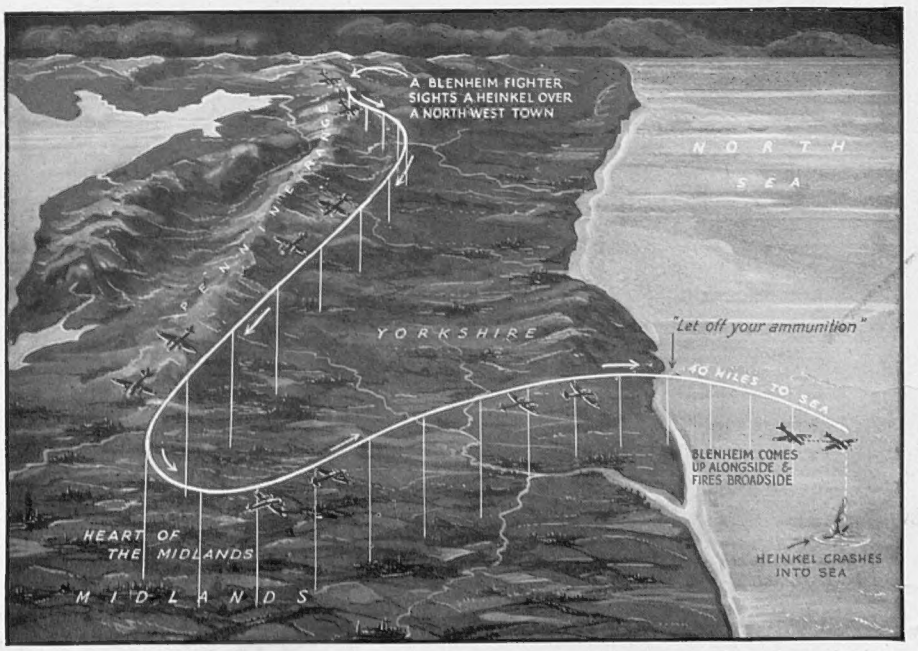
The bombing of the Antwerp dock area as a part of the general attack on the German concentration points for barges and shallow craft was an event of more than ordinary interest. Antwerp has always occupied a special position with regard to London; Napoleon, seeing that it was opposite the mouth of the Thames, sought to make it a deadly rival to English trade, but did not succeed. The recent bombing attack was made upon the famous dock area indicated in the view on the right above.

THE BOMBING OF THE ANTWERP DOCKS—*Drawings by E. G. Lambert and Percy Home*

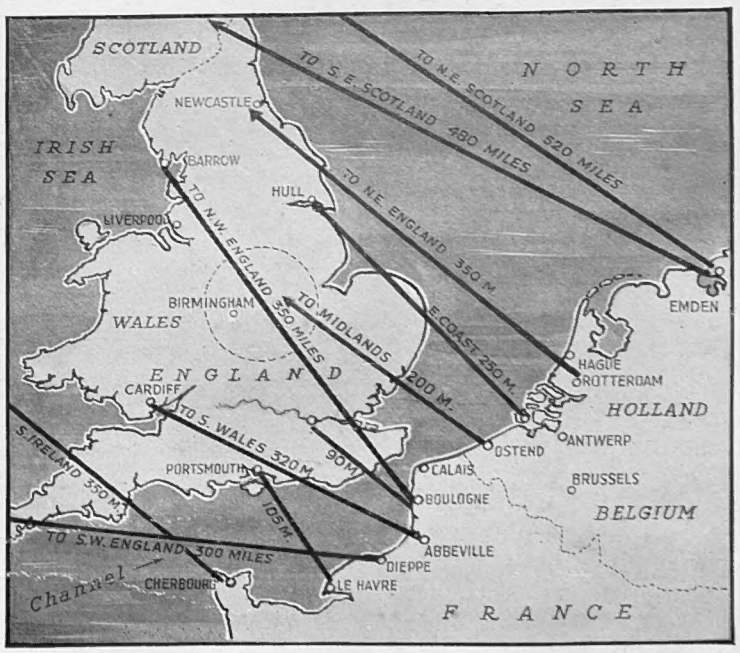
A warehouse and barges and shipping on both the north and south sides were hit and a big explosion and fires were also started in the basin. As shown in the picture on the right, Antwerp presents a striking silhouette as seen from a steamer passing along the Scheldt. It used to be dominated alone by the tower of the cathedral which rises to a height of 404 ft., one of the loftiest spires in the world. This has recently been challenged by a huge sky-scraper block occupied by a big stores. The huge mass of the building looks like a giant silo in the distance. A few miles away from Antwerp the Scheldt flows between Holland and Belgium.



THE NEW MODERN SKYLINE OF ANTWERP PRESENTS A GOOD GUIDE TO THE INCOMING BOMBERS OF THE R.A.F.



A GERMAN NIGHT RAIDER BROUGHT DOWN AFTER A LONG CHASE BY A BRITISH BLENHEIM: One clear night recently a British pilot saw bombs drop near a town in North-West England. A few minutes later, among the stars, he saw a light from a Heinkel, which led him first into the heart of the Midlands and then back up towards the Yorkshire coast before he headed for home. Forty miles out to sea the Blenheim pilot told his station that he thought he would have to give up the chase. He fired his front guns from about a quarter of a mile, and to his surprise found himself at once gaining rapidly on the Heinkel. He continued to fire, finished his ammunition, and was then able to come up alongside to let his gunner pour in a broadside that sent the Heinkel crashing into the sea



AREAS ATTACKED BY THE GERMAN BOMBERS—AND THE DISTANCES INVOLVED: This map is not claimed to give accurate details of the places from which the German bombers fly on their night raids: it is given here for purposes of comparison in connection with the mileage from various known bases in Northern France and the Low Countries

MORE ABOUT THE BOMB SQUADS

The Men Who Dig Out the Time-Bombs and Render Them Harmless

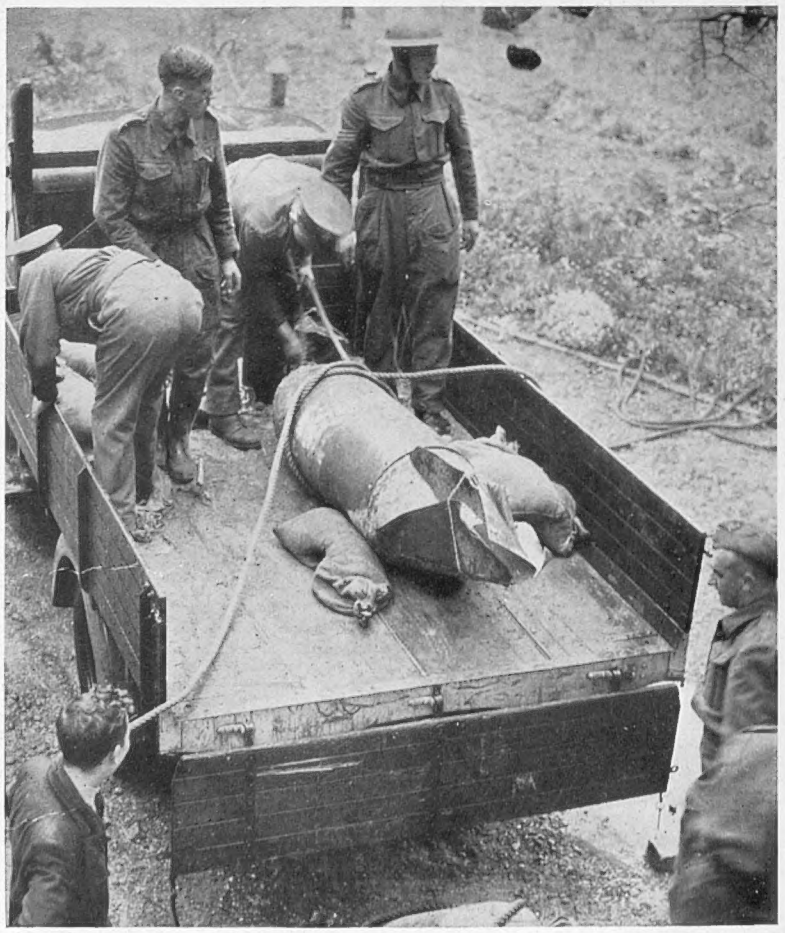
DIGGING OUT A ONE-TON BOMB, SIMILAR TO THAT AT ST. PAUL'S: Only half the bomb has been exposed; the other half is 20 ft. down. Note the curving path followed by the huge missile, which adds to the difficulties of the Royal Engineers

EIGHT MEN OF THE BOMB SQUAD RAISE A HEAVYWEIGHT TIME-BOMB FROM BENEATH A WEST LONDON STREET: An officer (seen partially in the centre of the picture) directs the operation, whilst the man who dug for, and located, the bomb in the crater lends a willing shoulder as it is hoisted up

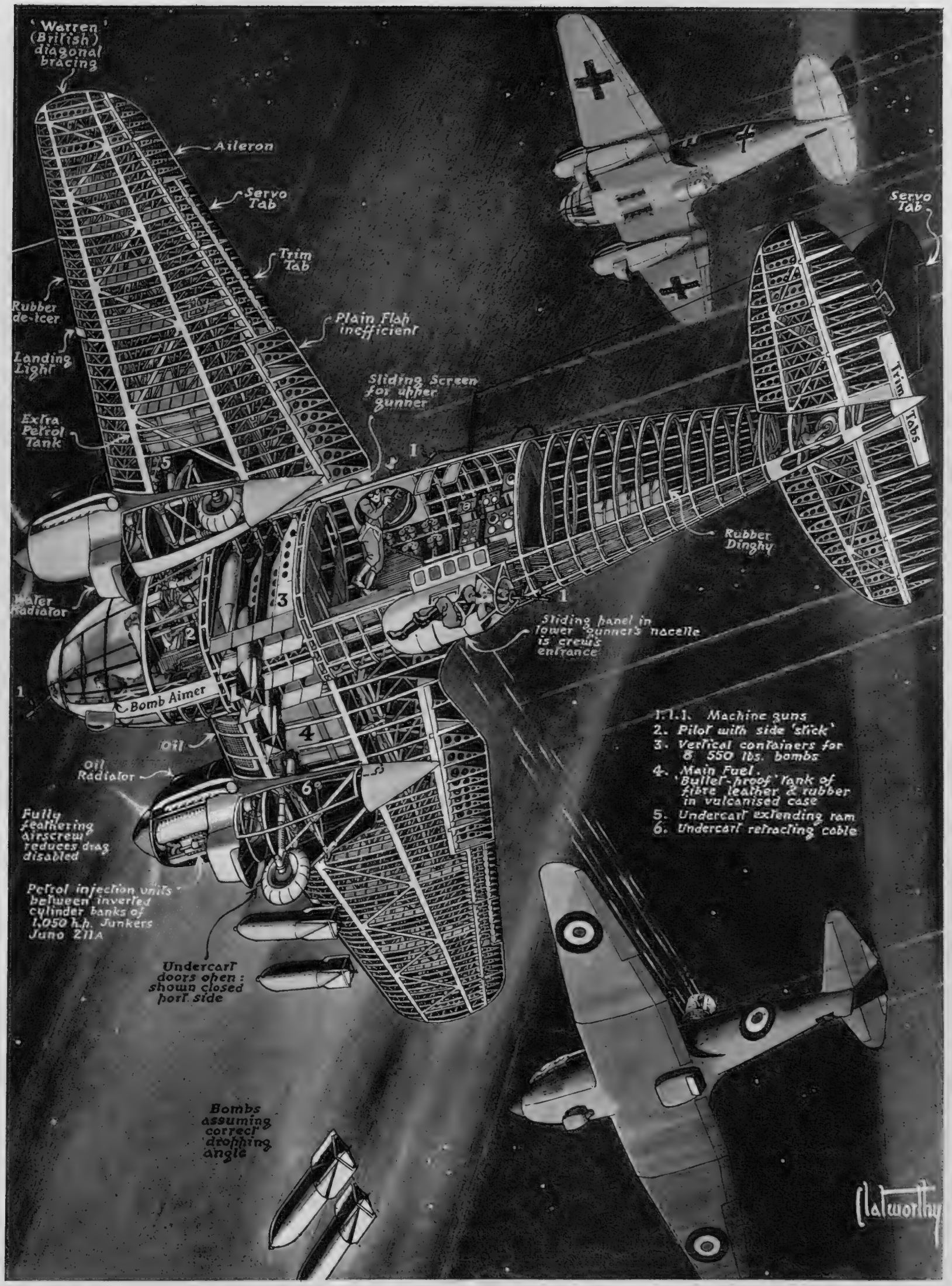
Three of the pictures on this page were taken during the course of operations by the Bomb Disposal Unit commanded by Lieut. R. Davies, who successfully removed the one-ton bomb at St. Paul's. These pictures were actually taken (of all places!) at the German Hospital in N.E. London, where a 1,200-lb. time-bomb fell in the grounds. The same procedure was followed with this as with the St. Paul's bomb: it was raised from a great depth, its time fuse was extracted by Lieut. Davies himself, and it was then taken to Hackney Marshes for explosion. In addition to Lieut. Davies' Unit, there are other squads of Royal Engineers performing similar duties. These men are—one and all—heroes: their work is one continued race against time, and no praise can be too high for their gallantry in the face of appalling danger

AS THE BOMB COMES UP FROM THE GROUNDS OF THE GERMAN HOSPITAL IN LONDON, LIEUT. R. DAVIES STANDS ON IT TO KEEP THE NOSE UP

LIEUT. R. DAVIES (seated in the crater) REMOVES THE TIME FUSE FROM THE HUGE BOMB WHICH WAS DROPPED IN THE GROUNDS OF THE GERMAN HOSPITAL



THE TIME-BOMB IS SUCCESSFULLY PLACED ON A LORRY READY TO BE RUSHED TO THE HACKNEY MARSHES TO BE EXPLODED



THE GERMAN NIGHT RAIDER

The Heinkel He 111k which has largely been used for the Night Raids over London

Drawing by S. W. CLATWORTHY

This diagrammatic drawing shows Germany's latest standard long-range bomber in detail—the He 111k, Mk. Va. Its preponderance in use, especially at night, is so marked that raiders are likely to become known as Heinkels just as they were termed Gothas in the last war. Less ugly than most enemy aircraft, it still has their typical hogged-back, sagged-tail, look of all-metal construction. It normally has a crew of four; with a 74-ft. span, its top speed is 274 m.p.h., and its range is about 2,000 miles with 2 tons of bombs; the ceiling is 26,000 ft. Despite its defensive armour, it is nevertheless woefully weak and vulnerable (as with all German bombers), and its three machine-guns are crudely mounted with restricted zones of fire. Its detail design is tedious and involved, specially in the petrol injection system, owing to the need for fitting carburetters to take fuel of 87 octane as compared with the British 100. There is evidence of quick mass-production standardisation, as, for example, in the wings where the same bracing pieces are merely multiplied for additional local strength, a negation of quality in design which must carry the penalty of reduced performance and consequent loss of morale. Incidentally the Defiant may be expected to distinguish itself in combat with the Heinkel at night as, once located, it can stay with the doomed raider, not having to go straight at it or swerve aside, and possibly lose it again if at first unsuccessful. The salvo of bombs seen falling are of the type which have been so destructive recently in raids over the City and East End

b

IN PALESTINE: Cavalry fit the special needs of this country. In sp[illegible] of new are only suited to horse or mule. British Yeomanry are country and are everywhere received with the greatest cordiality. In fact, the security; they are also establishing a permanent link and bringing a better under

IN TRANSJORDAN: The Desert Patrol, a body of which is seen here, took part a week or so ago in a display at Amman, when the Emir Abdullah took the salute and in a speech made reference to the displeasure of Arabs at the coming of the Italian Commission to Syria. In the above view the Legion is seen in front of a fort built in the thirteenth century, and formerly used by the Kings of Damascus

In the LIBYAN FIGHTING AREA: During last week it became advancing into Egyptian terri[illegible] been watching every movement both from land and from the air. Our men in a healthy land. They have met and countered the heat and monotony officers of a forward unit on the Libyan front have got hold of a bic

THE WAR IN THE NEAR EAST

Pictures From the Three Territories of Libya, Palestine, and Transjordania

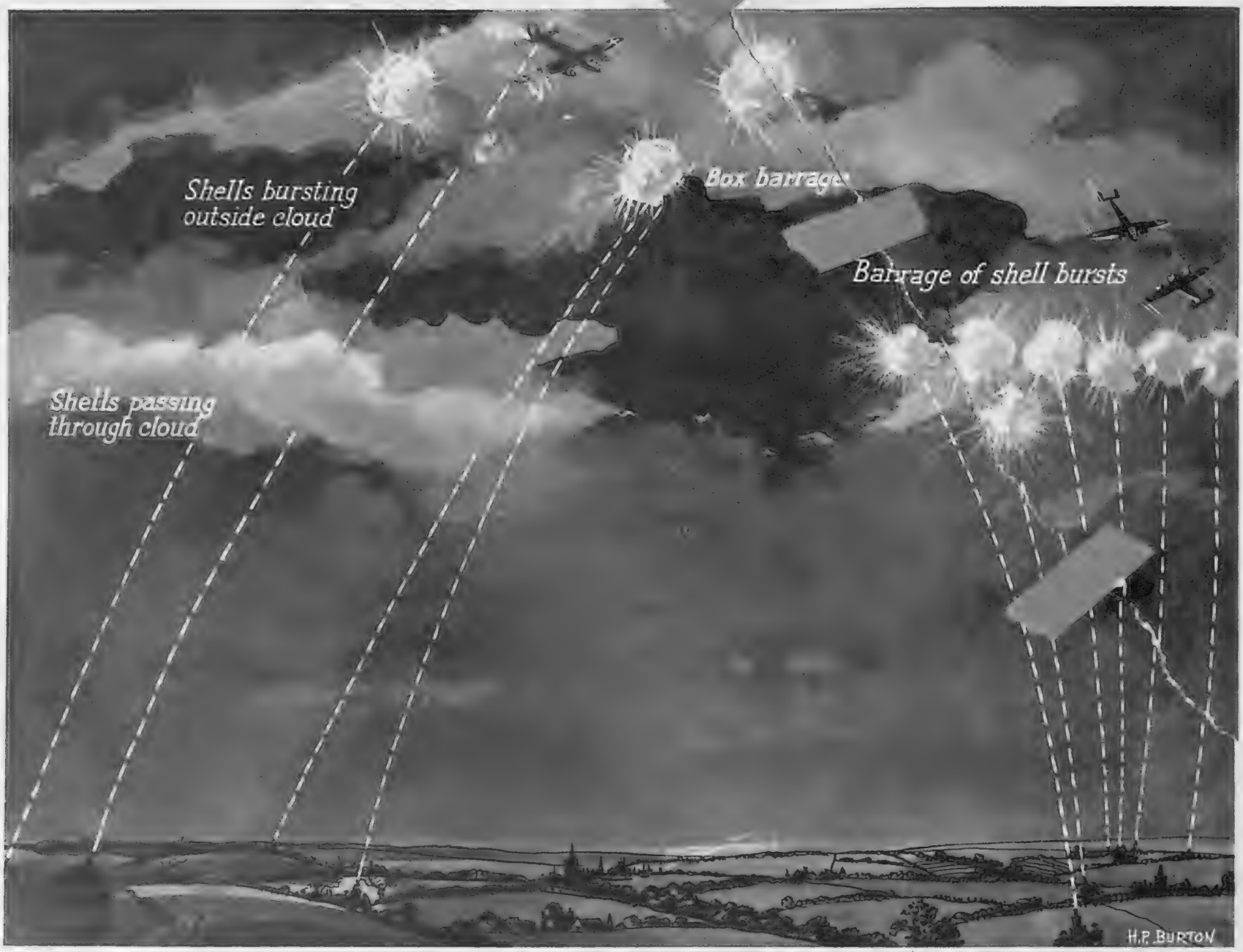
roads there are many parts of Palestine which doing extremely useful work in patrolling the Yeomanry patrols are not only maintaining public standing between the people and their governors

IN PALESTINE: These farriers of the Cheshire Yeomanry are at work in a patch of woodland country in Palestine. They form part of Yeomanry forces which have been doing much good work in the mandatory area. They are at present scattered over the land, some doing patrol work and others controlling the northern frontier. While they are all envious of their comrades nearer the fighting, their keenness and interest are kept alive by constant patrols

IN TRANSJORDAN: A motorised column is here seen passing a sentry after the return from a desert patrol. It forms part of the very varied British forces of Transjordan; wherever one goes throughout the country, there is the liveliest interest in the war, and a great desire on the part of the younger generation to participate in it

apparent that the Italian forces were really tory along the coast road. British troops have have become very hardy owing to constant exercise of the desert by many ingenious devices. These fringed umbrella which provides welcome shade

On the Borders of the LIBYAN FIGHTING AREA: In Western Egypt, fronting the area where the Italians are reported to be advancing along the coast, the British forces are well supported by workmanlike tanks like "Fly Flapper" above. As we have previously shown in this journal, the equipment of our fighting forces in Egypt is very modern and efficient; and stiff opposition to the enemy can be expected. Incidentally, water will be one of the problems which the Italians will have to solve in any advance they make



HOW THE NEW "BOX BARRAGE" IS WORKED: The conjunction of anti-aircraft gun and predictor: This picture typifies one of the new methods now in operation over London at night. Having determined height, course and speed of the incoming aircraft, the four anti-aircraft guns—working in conjunction—"box in" the invader. Unless the enemy pilots are very quick (diving is the usual method of evasion) they are apt to be disabled—if not directly hit. Away on the right is another method of defence—an anti-aircraft barrage firing directly by visual observation

ONE of the most encouraging features in the defence of London during the past week is the success of the anti-aircraft barrage. This curtain of fire set up by light and heavy guns was tried out for the first time on September 11. It met with unexpectedly good results in turning back enemy raiders. The continuous roar of the guns drowned the sound of the aeroplanes and brought encouragement to millions of sleepless Londoners. Nine enemy aeroplanes were brought down by anti-aircraft fire on one night.

This barrage and the "box shooting" which goes with it is worked on a plan different from any previous actions by anti-aircraft

ONE OF THE SUPERB ANTI-AIRCRAFT GUNS FORMING PART OF LONDON'S OUTER BARRAGE: It must not be thought that the Defence of London is confined to guns within the Metropolitan area alone; the defences stretch right down to the coast—and even beyond. As the invading aircraft come up by way of Kent, Surrey, or Sussex, they are met by successive barrages from guns like the above. Many types of guns are employed—light, medium, heavy, and naval. The one above shows how completely the crew are protected, by a heavy steel screen, when in action; and also the heavy and solid recoil mechanism. This picture was taken during a recent inspection by the King

AN ANTI-AIRCRAFT UNIT ACTUALLY AT WORK AT NIGHT: Whilst this picture was being taken it was confirmed that one plane had been brought down by these guns, and it is probable that another was also hit by the same gunners and during the same action

The ANTI-AIRCRAFT DEFENCE of LONDON

By the New Type of Predictor and by the Anti-Aircraft Barrage

guns. Searchlights are not an integral part of the new method, although they are an essential factor of night interception by fighters. The defence against night-flying raiders is now worked on two separate methods, the anti-aircraft guns firing with the aid of a new predictor system, and night-flying fighters co-operating with searchlights. Each system of defence is allotted a separate area of sky.

This new predictor for the guns is the essential part of the revised system. The new predictors, working on a method the technical details of which cannot be revealed, have been long awaited by the gunners. As more of the new predictors are produced and go into action and as the gunners become more familiar with their working so the effectiveness of the guns will still further increase.

The new predictor is more accurate in its plotting of the position and height of an enemy bomber than any type previously in use. The message from the predictor is transmitted to the battery of guns working with it. A complicated mathematical process is automatically completed so that allowance is made for the lag in time between the picking up of the aeroplane by the predictor, the transmission to the guns, the aiming of the guns, and the time taken for the shell to reach the target. That latter period may be as long as 10 secs. during which time an aeroplane flying at 230 m.p.h. (the cruising speed of the Heinkel He IIIK bomber) would move forward more than half a mile.

Thus the working of the predictor, with so many variables to take into account, is of necessity complicated. To reduce the margin for error and increase the chances of an aeroplane flying into a burst even though it should change course between the moment of prediction and the arrival of the shell, a method of firing termed the "box barrage" is used. That means that four or more guns served by the predictor fire practically simultaneously, endeavouring to "box" the aeroplane between four shell-bursts, all or any of which may cripple it. Whichever way the machine turns it still finds itself within the box. Rapid changes of height is perhaps the best method of evasion. But when such action has to be taken one object is achieved—bomb aiming is impossible.

At present this country does seem to have achieved a lead in anti-aircraft defence just as it has in the design of fighters and bombers. We can confidently look for still better results in the future.

Peter Masefield

On right—**THE WONDERFUL NEW PREDICTOR WHICH IS ALREADY ACHIEVING GREAT RESULTS:** The answer to the air attacks on London was not slow in coming: after the feeling of helplessness engendered in Londoners by the two first heavy raids on the Capital, it was soon realised that the enemy was not to have it all his own way. The new "predictors" now being used are wonderful instruments—like "sausage machines," as one American correspondent has described them. They turn out, at lightning speed, the course, height and speed of the aircraft overhead—and then show, not where the aircraft *is* at that moment, *but where it will be when the shell explodes in the sky!* This predictor is a wonderful improvement on the former type; but, good as it is, we are at present only witnessing the new science of prediction in its infancy. Every day the gunners are becoming more and more versed in its intricacies; and soon the task of the night raiders will become more and more hazardous. Incidentally a crew of six are required to man the predictor when the guns are in action. By cutting out the searchlight beams—because the predictor does not depend on these—the uncertainty in the cabin of the bomber as to where and when the next burst of shells is going to occur must be a great factor towards demoralisation

THE DEFENCE OF LONDON: Men of the Anti-aircraft Barrage Actually at Work During a Raid on London

Here are three of the guns forming part of London's barrage actually in action during a raid a few nights ago. The crews, illuminated by the flashes of their guns, are the men who, night after night, are putting up the new "curtain of steel" to repel the invader by air. Placed on the ground round the guns and ready for instant loading are the shells which will soon be hurtling 20,000 ft. up. The guns around London are becoming more effective as the various tricks of the Germans are becoming known

SCIENCE PLAYS A GREAT PART IN THE LONDON DEFENCES

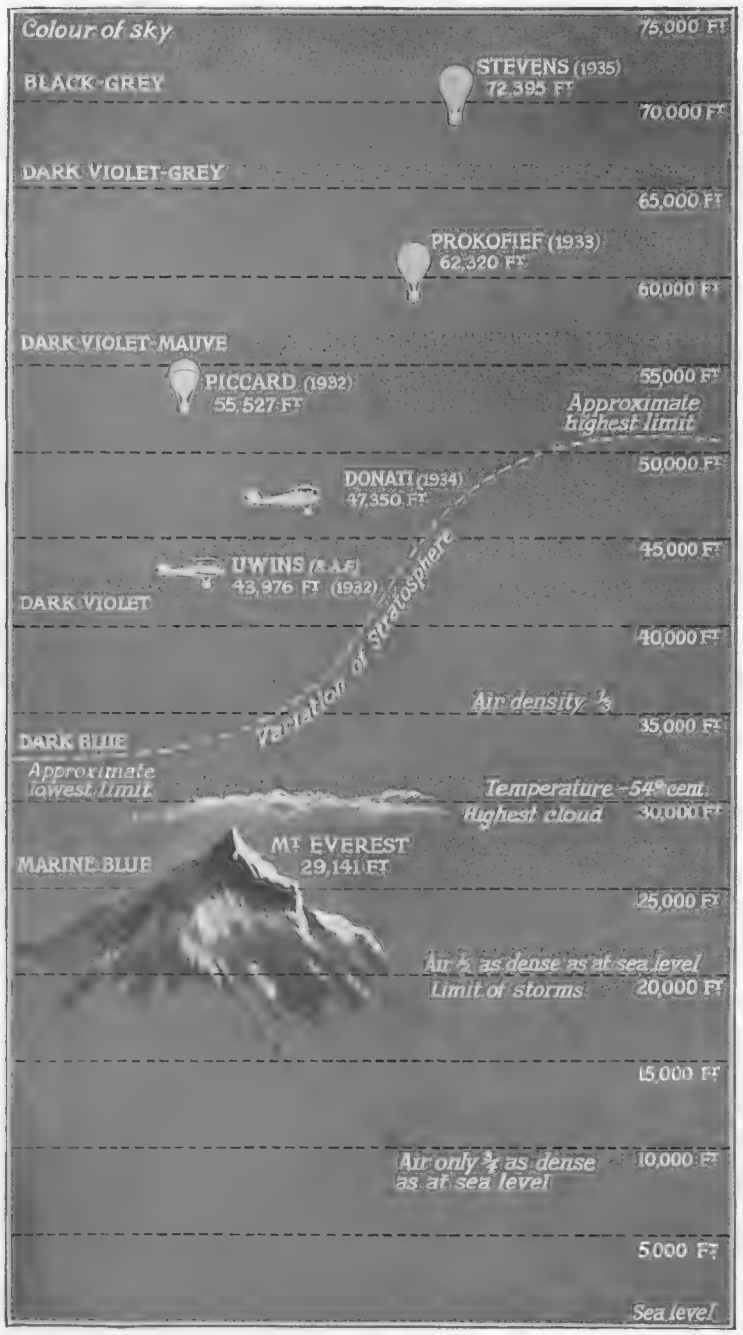
Some New Pictures of the Instruments Which Are Being Used to Defeat the Enemy's Raiding Aircraft

THIS IS A TYPE OF QUICK-FIRING GUN WHICH LONDONERS HAVE RECENTLY BEEN HEARING AT NIGHT: This "light" anti-aircraft gun fires a "clip" of four shells in very rapid succession. It can be fired through open sights, and can be traversed very quickly to follow the actual course of the aircraft. Its bark has been music to Londoners' ears for nights past

WATCHING THE COURSE OF THE RAIDERS: The Colossal "Height Indicator" of an A.A. Battery, Manned by its Crew of Four: The anti-aircraft gunners have certainly demonstrated their worth during the recent attacks by enemy aircraft. For every machine destroyed, dozens have been turned back by the barrages of fire which these men have sent up into the skies. This Heavy A.A. Battery of the Royal Artillery was formed after the Munich crisis; it includes titled officers and men, business men and teachers, butchers, University professors, and others—all fighting for the common cause. These men took up their stations at the beginning of the war, having had only a few months training. Now, with their equipment modernised and with actual war-time experience, they are a vital part of Britain's defensive line

On left—**FOLLOWING AN AEROPLANE'S COURSE IN THE SEARCHLIGHT BEAMS:** Here is a "Projector Controller": this is a hand-controlled apparatus, by means of which the searchlight's beams keep an aeroplane constantly in view. The latest type of projector (or searchlight beam) is capable of automatic movement which is transmitted electrically from the nearby sound locator

ANOTHER OF LONDON'S DEFENCES: An improved version of the Sound Locator, which is capable of giving rapid and accurate information of a raider's height and course



FLIGHTS INTO THE STRATOSPHERE—And the Colour Characteristics of the Sky as One Goes Higher and Higher: The stratosphere is that region of the upper atmosphere where the temperature ceases to fall with increasing height and either remains constant or slightly *increases*. The lower limit of this region over the British Isles is nearly 7 miles, but it varies from 5½ miles to 8 miles according to the barometer. Various attempts to fly beyond this region have been made during the past few years; and these are indicated in the diagram above. At the left the colour characteristics of the sky at various heights are indicated. Needless to say, the higher levels have only been attained by balloon, not by aeroplanes. The atmospheric density as one goes higher and higher is also indicated: this has a great bearing on the problem of stratospheric flight

PROPERTIES OF THE STRATOSPHERE LAYER, the Lower Range of which is Reached by High-Flying Planes: The presence of a special layer above the Earth's immediate atmosphere was made evident, firstly by a daily ebb and flow of electrical energy which was found to play an important part in long-distance wireless; secondly, by the capacity of this layer to stop a large proportion of Cosmic Rays coming from Outer Space. It might not be possible to enter the realm of Outer Space owing to the presence of these Cosmic Rays

SPECIAL SPHERE SECTION

HIGH FLYING

—And the Problem of Stratosphere Flight

Can the High-Flying Bomber Use the Higher Levels for Long-Distance Flights over Hostile Territory, where he Would be Immune from Enemy Gun-fire?

By PETER MASEFIELD

DEVELOPMENT of military aeroplanes—always accelerated by war—is invariably concentrated along four main lines: higher speed, greater range, bigger load-carrying powers, and the attainment of still greater heights.

In the development of bombers in particular this latter attribute is of immense importance. By flying high a bomber can escape from bad weather, from the beams of searchlights, it can make anti-aircraft fire very much less accurate and it can more easily evade the interceptor fighter. Thus in Great Britain, the United States, and in Germany much work is going forward on the development of high-flying bombers, and, as a corollary, of still higher-flying fighters to deal with them.

First let us see why all these advantages are gained by flying high and then examine what must be done to achieve great heights.

"Overweather" flying is a term used in the U.S.A. to describe flights made at heights greater than about 20,000 ft. The local storms which are such a problem near the earth's surface are not usually found higher than 20,000 ft. Hence the descriptive title. In America there is a saying that "flying through a storm is lots of fun—afterwards when you're safely on the ground." That represents the attitude of most flyers.

As a general rule, cumulus cloud, the thick woolly stuff, does not extend much above 4,000 ft., but thick cloud can extend up to about 17,000 ft. The cumulo nimbus—the thunder cloud—averages 5,000 ft. Above that is the much lighter alto cumulus cloud at about 12,000 ft. Above that height the clouds are rarely troublesome and the air much smoother. There is cloud above 12,000 ft.—the cirro cumulus around 20,000 ft., the cirro stratus around 22,000 ft. and highest of all the cirrus at about 30,000 ft., but none of them provide much impediment to normal flying. Above 35,000 ft. is the so-called stratosphere which is clear of cloud.

As an aeroplane goes higher so the density of the air decreases—and so does the temperature. At 10,000 ft. the air is only three-quarters as dense as at sea level. At 20,000 ft. only half as dense, at 35,000 ft. the relative density is only one-third.

This has an important effect on the motor of an aeroplane, for the power of the engines is proportionate to the density of the air drawn in to mix with the vapourised petrol. Thus at 20,000 ft. an unsupercharged motor will give only about half the power it yields at sea level. On the other hand, if the power can be maintained at height an aeroplane can be made to go much faster because the thinner air results in much less air-resistance.

Hence the ideal is to supercharge the engine to maintain power at height and so to fly faster in the less dense air and smooth conditions.

There is a limit to this. For one thing power is required to drive the supercharger and thus one can get a state in which half the power of the engine is used in driving the supercharger alone. Also the old fairy tale about speeds of 1,000 m.p.h. being attainable at umpteen thousand feet does not hold good.

The reason for this is the compressibility of air. Above a certain speed air becomes compressible and the drag increases enormously. Curiously enough, this compressibility effect, or shock-wave as it is called, happens at the speed of sound. The speed of sound is 770 m.p.h. at sea level and decreases steadily to 660 m.p.h. at 36,000 ft., above which it remains constant.

No aeroplane is likely to be made to fly actually at the speed of sound, because the local speed of sound with its consequent vast increase in drag, occurs over the wings and cowlings of an aeroplane, where the air is speeded up, before the whole machine is travelling at that speed. So in general we may say that, with present methods, no aeroplane is likely to exceed about 650 m.p.h. at sea level or 550 m.p.h. at any height above 36,000 ft.

Still, that gives us quite a lot of speed to play with over modern averages. The fastest bomber in the world at present has a top speed of little more than 300 m.p.h. Now what must we do to attain high speeds high up?

First of all we must supercharge the engine. That is done on most military aeroplanes. For instance, the Hawker Hurricane single-seat fighter has a top speed of 272 m.p.h. at sea level, but with the help of the supercharger, which maintains the power of its Rolls-Royce Merlin motor, as it gains height it attains 335 m.p.h. at 17,500 ft.

All superchargers used in this country at present and most superchargers used elsewhere are of the mechanically driven centrifugal type. They consist of a series of vanes driven at very high speeds—about 30,000 r.p.m.—through gearing at the back of the aero motor. Their function is to force a greater weight of air into the motor than it could "breathe" in the normal way.

But there is another source of power available at height which is normally allowed to go to waste. It is the power of the

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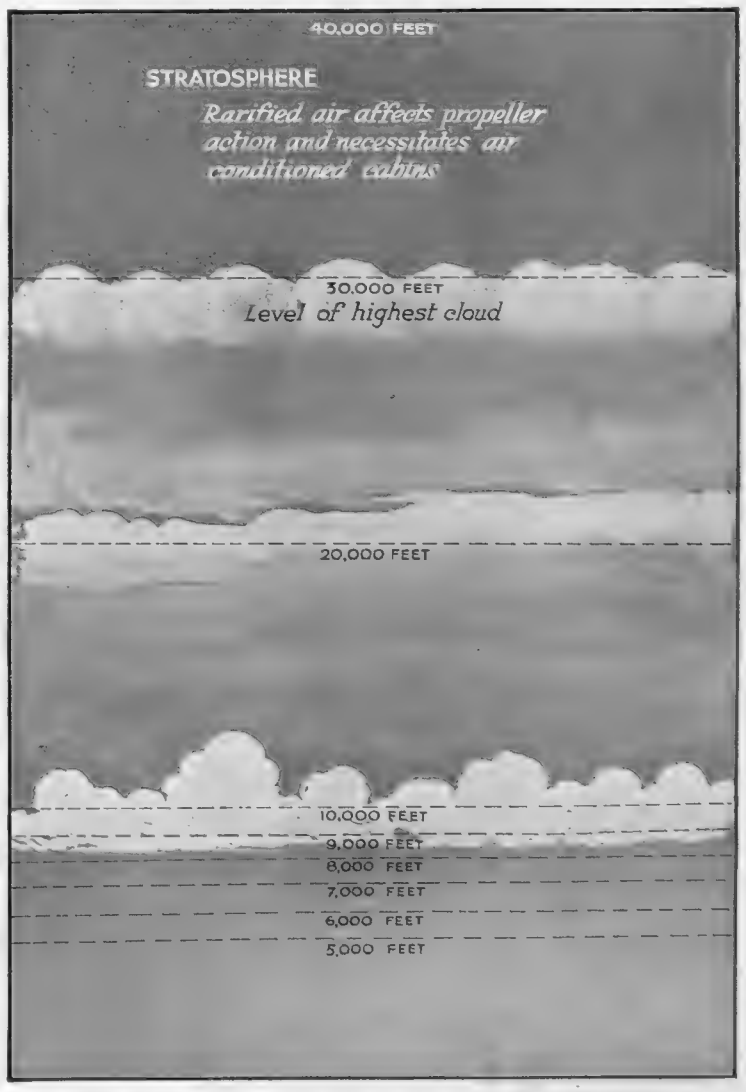


WHERE THE CLOUD ENDS—AT 30,000 FT. IN THE STRATOSPHERE: In the stratosphere there is no cloud; in fact, there is no "weather" as we understand it lower down. Hence the American term of "over-weather." The local storms which we experience on the earth's surface are entirely absent above 20,000 ft. Yet when the high-flying aeroplane surmounts these difficulties, the rarity of the atmosphere presents a set of new problems, which are discussed in the accompanying article

HIGH FLYING—The Problems of Stratosphere Flight

(Continued from preceding page)

exhaust. And in an aero-motor which develops 1,000 h.p. this potential energy let go in the exhaust is of the order of 300 h.p.—one-third of the power being used.

In the U.S.A. and in Germany experiments have gone forward to drive a "turbo-supercharger" with the exhaust gases. The chief problem has been to get metals to stand up to the heat. But there are enormous possibilities for high flying. Because the higher one flies the more useful does the exhaust become, as the pressure in the outer air decreases, and hence the available difference in pressure between the exhaust and the outside air is increased.

Having gained power for the motor at great height the second problem is to enable the crew of the machine to breathe. Oxygen apparatus is used by the crews of all military aeroplanes. An oxygen mask is strapped over the face and oxygen fed in through a tube from bottles stowed in the aeroplane. But this does not overcome the problem of reduced pressure on the body—the opposite to the effect on the deep diver. In height-record attempts pilots have been dressed in diving suits designed to reduce change of pressure on the body. But a more practical solution is to supercharge the whole cabin of an aeroplane so that the crew can move about in comfort and unimpeded by any gear.

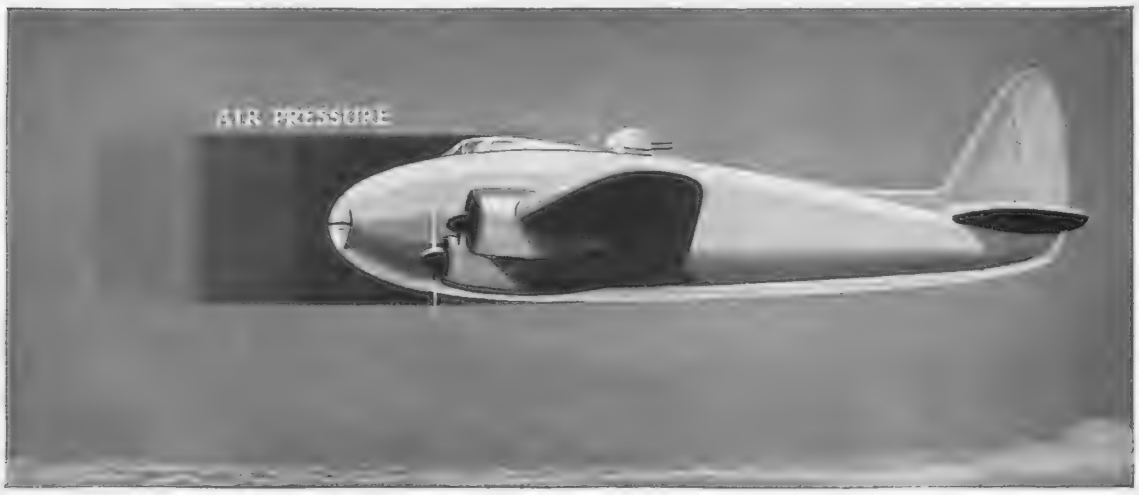
Experiments are pressing forward in this direction. The most practical solution has been found to be the use of a small separate motor to compress the air in the cabin. This involves extra weight but is worth it.

Up till a few years ago the airscrews provided a great problem in high-flying aeroplanes. If an airscrew was designed to be efficient at ground level it was most inefficient at height. The blades would not "bite" the air high up if they were designed to give a reasonable take-off. At height the engine tended to "over-rev" enormously because the airscrew had nothing to bite on to hold down its speed.

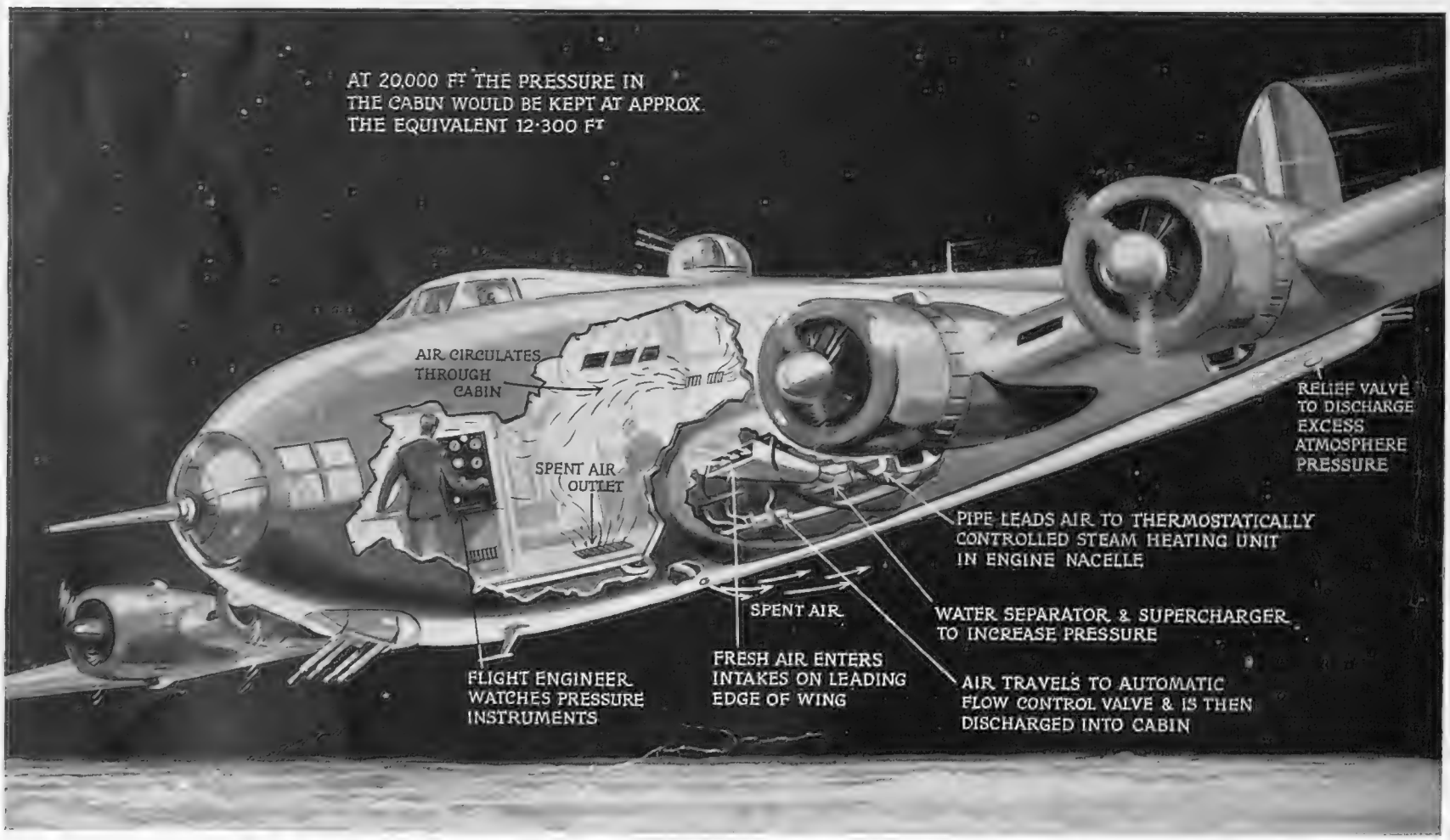
The invention of the variable pitch constant-speed airscrew has overcome this difficulty to a great extent. The blades are automatically turned to a greater angle to get an increased grip on the air as it becomes less dense. But there are limits even to this and high-flying aeroplanes must have specially designed airscrews of big diameter.

The cooling of the engines presents another problem, even greater than the heating of the cabin. One would think at first sight that at 35,000 ft., when the temperature is minus 54 deg. C, there would be no difficulty about cooling. But in a liquid-cooled motor water boils at a lower temperature as height is increased, and in an air-cooled motor the amount of air available is not enough to keep it cool.

Hence, on high-flying machines special steps have to be taken to provide increased cooling area or increased



ONE OF THE PROBLEMS OF HIGH SPEED—AIR COMPRESSIBILITY: With very high speeds, the speed itself begins to militate against an aircraft: the air in front, through which the plane has to push, begins to be piled up or "compressed"—so that beyond a certain point, high speed itself becomes an enemy of higher speed



HOW TO OVERCOME THE PROBLEM OF REDUCED AIR DENSITY AT GREAT HEIGHTS—THE SUPERCHARGED CABIN

A similar arrangement to that shown by our artist in the above diagram has been adopted by the American Boeing "Stratoliner" (or Stratosphere Liner). At great heights pilots in service machines use oxygen masks; these, however, only supply oxygen through the mouth to render breathing easier—they do not overcome the problem of reduced pressure on the body. By means of a system such as that above, however, the pressure within the cabin could be maintained at a reasonable level, permitting free movement and free manœuvre—as would, indeed, be necessary if the crew were to fulfil their proper functions. And this would be carried out without the use of oxygen masks within the cabin itself. At 20,000 ft. the latter would be supercharged as if it were only at 12,300 ft.; the degree of supercharging could then be maintained at will by the crew

Drawing by Roland Davies

"FLYING FORTRESSES" IN ACTION HIGH UP IN THE STRATOSPHERE

In this picture, our artist has envisaged an air battle of the future, high up beyond the clouds—beyond the "weather" even! The very high-flying bomber cannot be allowed to carry out its attacks unchecked, so that the defending Air Force has also constructed above-the-weather aeroplanes. This type of aircraft must, of course, be "air conditioned" in the manner shown in the bottom left-hand picture. The defending aircraft would not be carrying bombs as would the attacking plane; therefore it would be in a better position to carry out manœuvres, although the fire-power of the attacker would be very heavy. Furthermore, the fuel capacity of the defending machine would enable it to keep in the air for a very long time, a condition of things impossible with the lighter fighter aircraft—its capabilities in defence would thus be improved by the longer time of its patrol. The artist has here envisaged a possible encounter of two of these "flying fortresses," both flying high above the uppermost clouds. The defending craft is bristling with guns and it would appear that the enemy craft, still with its heavy load of bombs on board, would be at a grave disadvantage in the ensuing air battle

flow of air by means of ducts. Keeping the crew warm is the final problem. The supercharged cabin is again the best solution, for the air can be warmed as it is compressed. Electrically-heated clothing was used at first, but this was always either too hot or too cold, so the present equipment is a thick leather and lambswool coat and trousers with electrically-heated boots and gloves.

In summary we find the following reasons for flying high and the various methods of overcoming its peculiar problems:

REASONS.

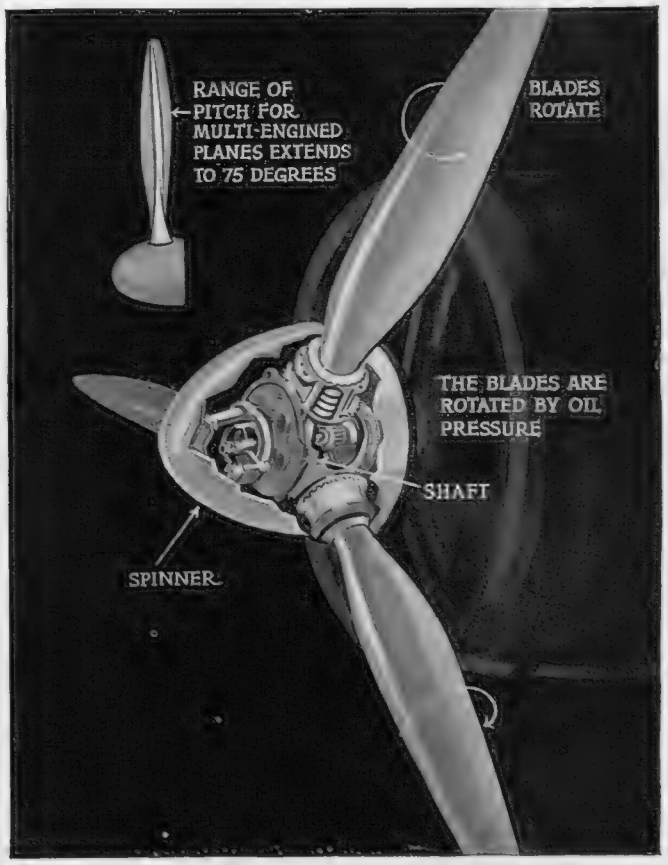
1. "Overweather" — above clouds, storms and in smooth air.
2. Out of range of searchlights.
3. Out of range of guns.
4. Too high for interception by fighters.
5. Too high for detection by sound. Also too high for accurate bombing but not too high for excellent photography.

PROBLEMS.

1. Supercharged engines (Turbo supercharger).
2. Special airscrews of large diameter.
3. Special cooling devices for engines.
4. Supercharged cabins.
5. Warmth for crew.

Although a great deal of study is going on in this country on these special problems there is a suspicion that Germany has tackled the subject with even more vehemence. We must press on with development so that we can continue to have the best aeroplanes in every category and deal with anything the enemy can produce while increasing our own production efforts.

THE "FLYING FORTRESS": The huge Boeing bomber fitted with four engines each of 1,000 h.p. This machine carries a crew of from seven to nine, has five machine-gun positions in the nose and four others in streamlined "blisters" in the fuselage. It can carry four tons of bombs and ammunition; has a maximum speed of 250 m.p.h. and the colossal range of 3,000 miles



HOW THE PROBLEM OF PROPELLER "BITE" IS BEING OVERCOME: When considering flight at very high altitudes one of the most difficult problems has been that of propeller "bite," as the air is so much thinner that the blades can get little grip. The "pitch" of these blades has to be such that they must get the aeroplane off the ground in denser air, yet be capable of sustaining it in the very much thinner stratosphere layers. The invention of the "variable pitch" propeller has simplified this problem greatly. By means of this invention the blades are automatically turned to a greater angle to give an increased grip as the air becomes less dense; this prevents the engine from over-"revving" in its effort to maintain the aeroplane's height, which might cause a breakdown. How the "variable pitch" propeller is operated is indicated in this diagram

WHEN THE SKY LOOKS "GRIM AND GAY": WAR'S SPLENDOURS BY NIGHT AS WITNESSED ON THE SOUTHERN SHORE—*Drawing by*

The dazzling brilliance of the modern searchlight produces many unexpectedly beautiful results. The beams are not all of the same intensity—one may be wide and soft, another a piercing pencil ray. In the coastal districts the effects are often such as to arrest the eye of an artist: and here "The Sphere's" artist, Mr. Montague Dawson, has recorded a scene along the southern coast, the criss-mirror, in the waters of the creek. The play of searchlights on the able: but in London the searchlight has largely been displaced

THE SCENE IN A SEARCHLIGHT CONTROL ROOM IN AN EASTERN DISTRICT: An A.T.S. girl manning the switchboard and receiving messages from the advance Observation Posts, from Headquarters, and from the guns. This switchboard is never left unmanned. At night all is tense; within seconds of a message being received the commander of the searchlight can give his orders and the sky is swept by an 800,000,000 candle-power beam

OUT ON THE DARK COUNTRYSIDE: Nothing is more startling than the way in which the searchlights leap into activity. For a minute or so the target is held; then again sudden darkness descends

Where the SEARCHLIGHT Plays Its BRILLIANT PART

Around England's Coasts Brilliant Rays Leap Into Activity Directly Any Suspicious Move Occurs on the Sea or in the Air

SEARCHLIGHTS FLOODING PART OF THE EAST COAST: In the task of keeping guard over the East Coast the searchlight squads are still playing their part. Whenever there is an unfriendly note by night in the air, or from the direction of the sea, however faint, the searchlights leap into activity. The effulgence from the beams lights up whole stretches of the nearby shores

Montague Dawson

BIG SWATHS OF LIGHT stretch out towards the sky and across the dark sea when German minelayers or other interlopers approach. The crew of the searchlight can broaden out the beam when necessary as shown here

THE ORIGINAL SCHEME FOR LINKING OBSERVER CORPS, LISTENERS, SEARCHLIGHTS, PREDICTORS, RANGE-FINDERS, GUNS, AND INTERCEPTOR PLANES

Ranged along the South-East coast are the countless Observer Corps stations. They are the first ears and eyes of the night; they pass their information to the big-eared listeners, and so the chain goes on in rapid succession until the guns are reached. Through the work of the predictor the time fuse is set and the shell sent skywards with all allowances for course, speed, wind deflection, and other factors. This system is being perfected in many directions, giving increased rapidity of action in every field

crossing beams being duplicated, as in a coast facing the Channel is still considerby the employment of the predictor

Drawings by Montague Dawson

HOME AT DUSK: ONE OF THE PRIVATE MOTOR YACHTS, NOW PART OF THE NAVY, RETURNS TO HER HOME BASE AFTER PATROL IN THE SCILLIES

The Auxiliary Patrol Service

The New Scilly Islands Patrol of the Royal Navy

SINCE the outbreak of war a new Fleet has been acquired by the Royal Navy—the Auxiliary Patrol Service. The activities of this special service have not hitherto received very much publicity in the Press; and it is for this reason that we reproduce the pictures by Mr. Montague Dawson, THE SPHERE'S naval artist, published here.

When war broke out a number of fishing craft were taken over by the Admiralty as patrol vessels and as part of our submarine defences. These were later reinforced by yachts, which their owners placed at the disposal of the Navy. "In recent months," declares a Special Representative of *The Sunday Times* in a recent article in that journal, "the Patrol Service has been strengthened until now it forms a cordon round our shores from Wick round the East and South Coasts and up the West Coast as far as Larne and Liverpool. In the waters near these shores the boats of the Patrol maintain a ceaseless watch in any sort of weather conditions that come along.

"The average crew of a small motor yacht is a second hand, an engineer, and two ordinary seamen. Most of the officers are drawn from the Royal Naval Volunteer Reserve, and there is usually one officer to six yachts. In the case of trawlers and drifters there is one officer to two or four vessels, with skippers in charge of the others. The fishermen who man the trawlers are specially enlisted.

"Even were there a Conrad or a Herman Melville to immortalise the exploits of the Auxiliary Patrol, the tale would have to be deferred. The fewer details available to the enemy of its work and of the exact areas in which it operates, the better.

"This much can be said—that danger has become a matter of routine with these fishermen and yachtsmen, of whom few, except the Royal Naval Reserve gunlayers, have naval training. Many of their boats are such as, for peaceful purposes, would be considered fair-weather craft, and cannot be fuelled for long trips. Generally speaking, four-day tours of duty are carried out by trawlers, and the small boats are used for shorter spells.

"It can also be said that some of the boats are in action every day against enemy aircraft, but the full story of their exploits is one that the future historian of the Patrol will have the greatest difficulty in piecing together."

A PATROL MOTOR CRUISER, ARMED FOR WAR, HURTLES PAST A LIGHTSHIP OFF SOUTH-WEST BRITAIN

On left—**A PATROL YACHT, CRUISING IN THE BROKEN WATERS OFF THE SCILLY ISLANDS**

A "CHANGE OF WIND" IN THE CHANNEL

When the Sea is Apt to Exhibit a Dangerous Mood

A STORMY SKY AND HEAVY SEAS: This picture shows the Channel in one of its less placid moods. With a rising wind, the narrow waters are apt to get choppy, giving even big boats a nasty crossing. Such seas would certainly not be kind to the unstable flat-bottomed craft, heavily laden with men and equipment, which the Germans intend to use for invasion

ANOTHER ASPECT OF THE CHANNEL, WITH A DESTROYER MAKING HEAVY GOING: Here the wind has suddenly freshened, and even the destroyer is taking a nasty buffeting. The combination of a strong wind, heavy sea, and cross-currents is one of the problems to be faced by an invader by sea

THIS IS A DANGEROUS SEA FOR SMALL CRAFT; AND THE OVERCAST SKY HOLDS NO PROMISE OF IMMEDIATE IMPROVEMENT

—AND THIS IS HOW THE ANGRY WAVES BEAT UP AGAINST CERTAIN STRETCHES OF THE ROCKY CHANNEL COAST

These four pictures have been selected to show certain of the moods of the English Channel when it is whipped up into angry motion by wind and tide. Last week, for some time, a gale raged throughout the narrow waters—and we are now reaching the time of year when these gales will increase in frequency. Should the weather be rough—as all cross-Channel travellers know too well—it can be *very* rough, even on a comparatively big steamer. What it would be like on an unstable flat-bottomed boat can be left to the imagination. If the German invasion is to be carried out (even in part) by the latter means, it would seem that calm seas are almost a necessity

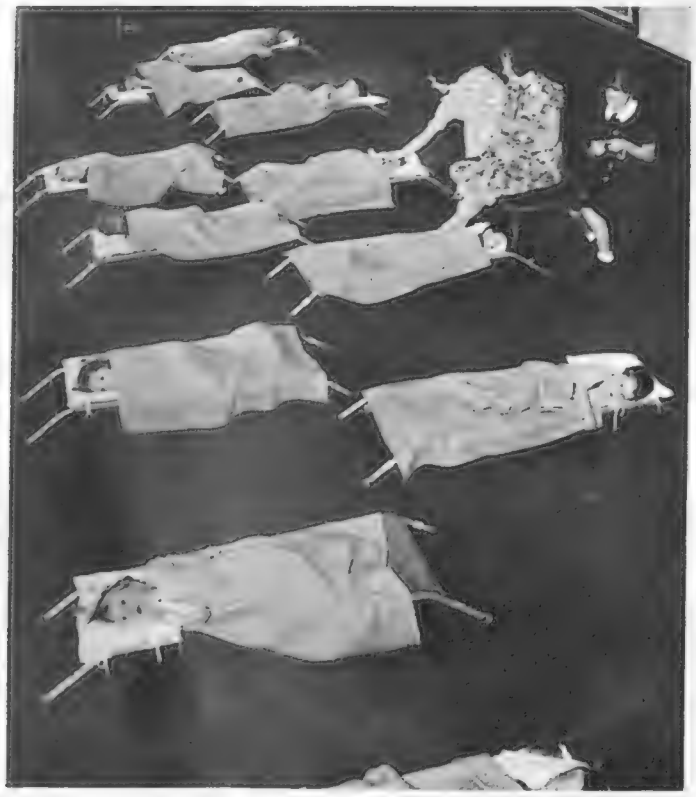
ROEDEAN MOVES TO THE LAKE DISTRICT: Most of the girls have bought cycles, and anticipate many rides in the magnificent surrounding Lakeland country

WOMEN PORTERS ON THE UNDERGROUND: Nineteen women porters have just begun work at various London Underground Stations: they are taking the place of porters called up for service, and more will be employed as other men go into the fighting forces. The women wear white dustcoats and grey caps

ROEDEAN GIRLS WALK THROUGH KESWICK'S ANCIENT STREETS

ROEDEAN'S NEW HOME: The famous Girls' School near Brighton has been evacuated to Keswick, in the lovely Cumberland Lake District. The girls now occupy the whole of the Keswick Hotel

NO GLOOM OR DEPRESSION HERE: This group of girls have entered under the Government Training Scheme; they are receiving instruction in Analytical Chemistry at the Battersea Polytechnic Institute. During their tea interval Miss Nancy Bright entertains her colleagues on the mouth organ



NURSERIES FOR WAR BABIES: Mothers who are on war work in a North-West town now have three nurseries at which they can leave their babies under five years of age whilst they are at the factories. The children are in the care of trained nurses throughout the day, and mothers can leave their children from 6.30 a.m. until 9.0 p.m. for 1s. per day. *Above*—The children are seen resting; and *on right*, out for a walk with a nurse in the autumn sunshine

LONDONERS GET HOME SOMEHOW: It takes more than a few traffic delays to keep workers away from their factories. This is one way in which suburbanites attract the attention of motorists during the evening trek home

THE NEW DIRECTION SIGNPOSTS: The removal of all signposts throughout the country has proved highly successful—unless one is thoroughly familiar with a district it is almost impossible to make rapid progress. To aid motorists in a general way, however, posts such as the above are now being erected at key points on main roads. The information they give is of the briefest, but they do help by giving a general sense of direction

WORKING LIKE A HORSE: When the air-raid warning sounds, instructions to milk roundsmen are to take the horse from the shafts and tie him up behind. This is what Mr. J. L. Vinson of Hanworth did. But the "All Clear" was delayed and the milk problem in the district was becoming acute. So Mr. Vinson, unable to put the horse back in the shafts, decided nevertheless to carry on with his duties: accordingly, he put himself in the shafts and pulled both cart and horse round to his customers' doors!

GENERAL CATROUX IN LONDON: General Georges Catroux was formerly Governor of French Indo-China: he was superseded by Admiral Decoux by order of the Vichy Government when he refused to carry out their instructions. He has now arrived in London and has joined General de Gaulle. General Catroux' adherence to the cause of Free Frenchmen is calculated to have a very far-reaching influence in some of the important parts of the former French Empire which have still to choose between the dictates of the Vichy Government and the call of a free and unfettered France. General Catroux is sixty-three years of age: he left a post in the French War Cabinet in 1914 to become the youngest captain in the French Army

THE DUCHESS IS STILL IN TOWN: A picture taken a few days ago, when the Duchess of Kent paid an informal visit to the Postal and Telegraph Censorship Department in London. Oblivious of imminent air raids, she toured the building and chatted to many of the staff

AN ODD SIGHT IN LONDON: In consequence of the air raids it was decided to remove this relic of an earlier and a happier London to a place of greater safety outside the bombed areas. Hence many spectators in the City were treated to this unique sight a few days ago as this fine old horse-drawn omnibus was carted to storage by one of its petrol-driven competitors

AIR COMMENTARY BY CHARLES G. GREY (Founder of "The Aeroplane")

MORE ABOUT MAN-HOURS

This War Will be Won in the Factories—and Especially in the Aircraft Factories. It is thus a Question of Man-power; and we must do our utmost to Protect and Strengthen Output against Attack from the Air

THE nicest American woman in Europe—she came from "See-atl, Wash."—told me a story years ago which has its applications to-day. A partly English-speaking Swede immigrant was driving a team of mules up a rocky mountain and the mules jibbed. He encouraged them with voice and whip till a back wheel went over the edge. Then he jumped, and as the wagon and team rolled down the mountainside, he shouted after them, "Now I hopen you got you dam satisfy."

Some of us who for twenty years have been trying to persuade this nation to build such a big Air Force that no other nation would dare to attack us are feeling rather like that to-day. Lord Trenchard, Sir Samuel Hoare, Lieut.-Colonel Moore-Brabazon, and that little band of pro-R.A.F. Members of Parliament have good reason to feel that way, even though they be too polite or kind to say so—after Norway, Flanders, Dunkirk, St. Valerie, the "Battle of the Bulge" and now the bombing of Britain in general and of London in particular.

Fortunately we are an undefeatable lot, and shall in due course come out on top. But I wish that I had my way with the mules and fools who let us down.

The chief thing to remember to-day is that this is a war of man-hours. The fact cannot be too often repeated. And everything which will save time in workshops or transport is helping to win the war. Everything which wastes working hours is hindering the winning of the war.

A completely revolutionary-minded friend of mine says that the proper thing to do in London and in great manufacturing centres where armament is produced is to clear out everybody who is not directly employed on war work, and to find sleeping quarters in the cities within walking distance of their work for the people who are working.

He even advocates putting all the London war workers, that is to say the administrative staffs of Government departments and of the big manufacturing firms and so forth—down in the Tubes—desks, typewriters, dictaphones, and all—and keeping them there where they can work unhindered by the worst sort of bombs, letting them up between air raids for fresh air and exercise.

Not such a fool idea as it looks. The chief drawback to it is that the power stations which supply the Tubes with fresh air as well as motive current are above ground and comparatively easily bombable.

I suppose that by this time, if the London power stations are bombed the Tubes can switch over to the Grid, but I seem to have heard of hold-ups on the Tubes within the past year or so without any bombing to help.

Years ago the people who understood the possibilities of Air Power talked about underground aircraft factories and underground housing for Air Force machines. Learned mining engineers told them that no geological strata were known to exist which would stand making caves in them the size of aircraft factories, or even of R.A.F. aeroplane hangars. They talked of lines of cleavage, and of faults, and of sliding strata and so forth. But mere practical engineers wanted to know what was the matter with making huge excavations on the "cut and cover" principle, and covering the holes with roofs that would stand anything up to a bomb of a ton or more. With adequate pillars and girders and enough earth on top something of that sort could have been done. And if it had been done on a big scale with steam shovels and mechanical appliances generally I doubt whether such caverns would have cost any more than existing aircraft factories and they might well have cost less than some of those elaborate aerodrome buildings in which the R.A.F. lived in such princely fashion until the bombing started.

We have been told that this is to be a long war. Is the time still too late to put some at any rate of our war-machines and some of our factories underground? Incidentally, I wonder how much of our reserve food supplies are stored in the natural caverns of this country, such as the Cheddar Caves and those at Godstone and Matlock and elsewhere.

Quite a simple example of waste of man-hours happened to a friend of mine in one of the key departments concerned with the production of aircraft. His typist left the office at about five o'clock one afternoon, ran into an air-raid warning and spent a few hours in a refuge. She came out, made a little more progress homeward, ran into another air-raid warning and stopped there until five o'clock in the morning. The poor child ultimately got home in daylight, had an hour or so in bed and was dead-beat when she got back to the office. The result was that she was unfit for work, and essential typing of that office which had to hook up with equally essential work in other offices could not be done, and the nation's war effort was definitely hindered by the loss of a few mere girl-hours. Which only shows that a girl-hour may be even more important than a man-hour.

The benefit of foresight and common sense is shown by a certain important aircraft firm which has interests all over the country. Before the outbreak of war it had already arranged to shift its essential office staff to a quiet, out-of-the-way country place which is near enough to its chief interests for its senior staff to keep in touch with everything and far enough away from any place which was likely to be bombed, to be about as sure of immunity as anywhere between Land's End and John o'Groats.

If only the Government as a whole had been equally foresighted everything essential would have been underground and all essential workers would have been living on the spot and properly housed.

Fortunately the Germans are no better off than we are. Their very latest and best aircraft factories are right alongside beautiful model villages which are very handy for the workers getting to and from work, but are practically bound to be hit by some of the bombs which miss the factories. Therefore the German women and children of the working classes are no better off than are those in this country in industrial areas crowded round the factories, except that, like the workers in our few garden-cities, the German aircraft workers live in healthier conditions.

And yet, again like our own people, some of the older people hate living in the country. Dr. Hormel of the Henschel Aircraft Company told me three or four years ago, at their beautiful new factory some miles outside Berlin, that some of the older employees preferred to travel for more than an hour to get to work rather than move to the outskirts of Berlin and save travelling. They liked to live in the district where they had been brought up among people whom they knew.

All that travelling about between home and workshop means an appalling waste of man-hours and in a totalitarian state such as this in time of war it ought to be stopped. It is in fact quite a good excuse for the rather promiscuous bombing which seems to be going on both here and in Berlin. If public transport is hung up by casual bombing and roads are blocked, people cannot get home from work and cannot get to work in the morning. That is one of the most effective ways of clamping down what has now come to be called a "production blockade".

That is a nice phrase but it only means bombing the factories, which has been advocated in this paper ever since war broke out seriously.

You can bomb the ports to prevent raw materials from coming in. You can bomb the mines and the steel works and the oil refineries and all the rest of it and prevent raw material for the factories from going through. But I suspect that Germany has a pretty handsome reserve of raw materials, just as we have, and that their factories could go on working for quite a while even if raw material were cut off. But, as I have pointed out before, and the fact is worth repeating, if you smash the aircraft factories raw material is no good because there is nowhere to use it, and the aerodromes and the oil supplies and the armament are no good because there are no aeroplanes to put on them or to carry them.

Another phase of this man-hour business is the contemptuous neglect in years past by aircraft constructors and Air Ministry officials alike of the need to cut down needless complications in design, and in the specifications of material.

Some fifteen years ago when Mr. Bill Stout of Detroit started to design aluminium aeroplanes for Mr. Henry Ford, he plastered his design department with placards which read, "Simplicate, and add more lightness." And, considering what aeroplanes were in those days, the Ford Trimotor was about the least complicated and lightest thing which could be produced, although it looked like a corrugated iron barn, and was frivolously known as "the tin balloon."

In spite of that, our people here, and the designers in the United States too, kept on complicating instead of "simplicating" and adding more man-hours instead of "more lightness."

Likewise the scientists insisted on complicated formulæ for trick steels and light alloys instead of going flat out for simplicated raw material. At least ten years ago a friend of mine in the U.S. Army Air Service (before it became the Air Corps) said—"We don't use no trick steels or heat-treated alloys in our ships. We can't carry a heat-treating plant with the squadron, and any running repairs ought to be so that they can be done by the village blacksmith or the welder in the local garage."

That is the way to save man-hours, and man-hours are worth more than money can buy.

I am not saying anything this week about the *blitzkrieg* or our heroic pilots, nor am I asking rude questions about the persistent rumours of attempted landings on the British coast and what happened to them. I cannot help thinking that those stories of shot-down German pilots who ask to be taken to the nearest post of German troops come from a misunderstanding of languages, and that the pilot has really asked to be taken to the nearest prison-camp where Germans are kept.

The point is that this is going to be a long war; if it is not, so much the better. But if it is, the nation which uses its man-hours best is the nation that is going to come out of it best.

THE RUBBER DINGHY OF THE R.A.F.: Since the beginning of the war the lives of many airmen have been saved by the rubber dinghies with which their aircraft is equipped when they have been forced down over the sea for various reasons. In British aircraft the dinghy is packed, deflated, in a case like a Gladstone bag which is attached to the framework of the aircraft. When needed the whole bundle is thrown out, the ripcord is pulled and the cord which attaches it to the aircraft is severed. This picture was taken during practice by the R.A.F.; it shows the airmen clambering aboard and pulling their rations and other equipment with them

THE MAIDENHEAD HOME GUARD GO OUT ON PATROL: The idea of mounted branches of the Home Guard which sprang up amongst farmers and horse-loving folk in the district of the Wash has grown. Dartmoor and other open country districts followed, until every County seems to have its bodies of mounted Home Guards. Maidenhead is one of the latest districts to form a unit. It consists of members of the Garth Hunt—farmers, jockeys, and others

NIGHT RIDERS OF TO-DAY

Mounted Home Guard Units Formed in Every County

MR. HORACE SMITH, THE FAMOUS RIDING-MASTER, IS A BERKSHIRE MOUNTED HOME GUARD

MR. RIGBY CROCKER, O.C. THE BERKSHIRE UNIT OF MOUNTED HOME GUARDS. HE IS VERY KEEN ON THE EFFICIENCY OF THE UNIT

A corps of mounted Home Guards, consisting of Berkshire farmers and jockeys, led by Mr. Rigby Crocker, O.C., paraded during the week-end "somewhere in the Home Counties." The corps assembled at the riding-stables of W. J. Smith. Mr. Horace Smith, the famous riding-master, and Mr. Douglas Smith, jockey and Cæsarewitch winner, are both members

FAMOUS BUILDINGS AND THORO

Parts of Central and West End London As They Look To-

THE BOMB-CRATER IN THE STRAND JUST BY THE GAIETY THEATRE: In the last war a bomb fell near this spot and caused many casualties: it received a second visitation a few days ago, when gas mains were broken and other damage caused. The Gaiety Theatre is to the left of this crater and Bush House can be seen in the left distance

WORLD-FAMOUS LAMBETH WALK AFTER THE BOMBS: Three high explosive bombs were dropped here during one of the night raids. The market, famous all over the world was, however, very soon functioning again, and dwellers in the district were performing their well-known "Lambeth Walk" dance

OXFORD STREET FEELS THE FULL FORCE OF GERMAN SAVAGERY: THE BURNT-OUT JOHN LEWIS STORE

One of the great shopping centres of the world, Oxford Street was more than once attacked by the night bombers. The great "military objectives" of John Lewis, Bourne and Hollingsworth, Peter Robinson, and other world-famous stores were damaged—the John Lewis building bearing the brunt of the attack. This building was practically gutted by fire and water. To Londoners it seemed as if the bombers were deliberately picking this thoroughfare for their special attention

UGHFARES AFTER THE BOMBING

day After Visitations by Indiscriminate German Bombers

DAMAGE IN PARK LANE, NEAR THE KING'S FORMER RESIDENCE IN PICCADILLY: On the night that west-central London was bombed, this house in Park Lane, and Lord Londonderry's mansion as well, were damaged. Apart from the material damage, there was no loss of life as a result of this attack

ONE OF LONDON'S SHOPPING CENTRES—BRUTON STREET: The bomb which fell at this spot cut clean through a house and shop, but it left part of the upper floors intact. A famous tavern opposite the bombed building was, nevertheless, open and doing business the following morning!

THE HISTORIC LIBRARY OF THE INNER TEMPLE: All visitors to London know the quiet, historic Temple: there is not a building of military significance within sight of it. Yet it, too, has been a target for German bombs. A "curving" missile struck the tower and wreaked this havoc. The upper part was pulled down later by the demolition squad

COUNTY HALL, OPPOSITE THE HOUSES OF PARLIAMENT, BOMBED: This picture shows the enormous cavern, 30 ft. deep and penetrating to the cellar, caused by a German bomb on the Members' Terrace on the side nearest Westminster Bridge. All the windows along the terrace were shattered by the force of the explosion

ICELAND IS BEING FIRMLY HELD

By British and Canadian Forces—Naval and Military

A NAVAL OFFICER (IN ARMY BATTLE-DRESS, WITH NAVAL EPAULETTES) AND A NAVAL PETTY OFFICER (ALSO IN BATTLE-DRESS) WITH THE BRITISH OCCUPATION FORCES IN ICELAND

MEN OF THE "ROYALS" (CANADIANS) AND THEIR CAMP BY THE ROADSIDE, 17 KILOMETRES FROM THE CAPITAL TOWN OF REYKJAVIK

THERE ARE MANY BRITISH SHIPS IN ICELAND'S HARBOURS: HERE A SUB-LIEUTENANT OF THE NAVY IS COMMUNICATING WITH THEM BY ALDIS SIGNALLING LAMP FROM THE SHORE

RECRUITING NATIVE LABOURERS FOR WORK IN ONE OF THE CAMPS: THE RECRUITING STAFF ARE HERE SEEN ENLISTING THE WILLING ICELANDERS

CANADIANS OF THE "ROYALS" ENCAMPED NEAR ONE OF THE STRONG POINTS THEY HAVE BUILT ON THE ISLAND

After Denmark had been overrun by Germany it was decided that Iceland, one of Denmark's overseas possessions, must be held against a possible enemy attack. Accordingly British and Canadian forces were landed on the Island: to the Canadians, inured to a similar climate in their own Dominion, conditions in Iceland are not unfamiliar, although to the majority of British troops its rigours during the winter might prove considerable. In addition to the land forces, there are a number of naval vessels in the few Icelandic harbours: and these are co-operating in defence measures. Both Canada and the U.S.A. are vitally concerned in the effective defence of Iceland. The British and Canadian Governments have guaranteed the food and clothing requirements of the Icelanders

THE FEW STRATEGIC ROADS ACROSS ICELAND ARE HELD BY LEWIS GUN DETACHMENTS OF THE CANADIANS, ENTRENCHED IN SAND-BAGGED STRONG POINTS

Always ask for Schweppes
by name
There's nothing that is
'just the same'

Schweppes
SPARKLING
LIME

THE BOOKWORM: Seated on the collapsed shutter of a bookshop which was partly wrecked by a bomb, this young lad calmly peruses Alan Ivimey's "History of London." Later historians will be able to add a momentous chapter describing the courage, calm, and endurance of the Metropolis

THE SHELTER THAT JACK BUILT: Jack and Daphne Barker, the well-known West End variety stars, seen in their sand-bagged air-raid shelter which Jack Barker has built at their home in Hampstead

P. C. HULBERT: The famous Hulbert chin is now set on sterner lines. Jack Hulbert is still to be seen in the West End but only on duty as a policeman, as the picture above depicts him amid the air raid wreckage in Bond Street

The World of Books—By Vernon Fane

NOVELS : IMPERIAL AND DOMESTIC

The Poet Laureate in Byzantium; Fiction and War; A Book of Roman Portraits

THE Poet Laureate's latest work of fiction, **BASILISSA** (Heinemann. 8s.), is an historical novel based on the meeting between Theodora and Justinian. Much that is known about Theodora comes from sources which the historians describe as being open to serious doubts. Yet all seem to be agreed that she was a person of some beauty, of great intellectual gifts and with an imperious will.

Mr. Masefield begins his story at the point when Theodora finds herself in straitened circumstances as the cast-off mistress of the Provincial Governor Hekebolos. Words of wisdom and comfort from Timotheus at Antioch guide her back to Constantinople, the city of her birth, where she falls in with a dancing girl acquaintance of former days, who is making something of a sensation as *premier danseuse* in the famous Ballet of Sosthenes.

The city is riven by the factions. There are riots, public meetings and demonstrations galore, which do not, however, deter the old Emperor Justin from taking a personal interest in the ballet company. Thus, Theodora first met the heir apparent, Justinian. She not only saved his life, but gave him such wise counsel that he turned to her again and again when things were looking particularly black for the purple, or Imperial, family.

The story ends with the pledging of their troth, with the approval of the old Emperor as well as the death-bed blessing of the Empress Euphemia. Not, however, before the Empress has delivered herself of a forbidding speech, and thus brought about the author's compromise with Procopus.

In this story Mr. Masefield has weaved an interesting character sketch of an extraordinary woman and written the prologue to her rise to power. Justinian comes to life as the earnest but courageous young student of law with a hint of his future obstinacies and weaknesses, and there are excellent character studies of the old warrior, his uncle, with his rough speech and horse sense, and of the Empress, who wore high-necked dresses to hide the marks of the slave rings.

By inference the story may be related to modern times in the sense that an Empire's destinies were being shaped by the violence of gangster politics. Mr. Masefield shows us Byzantium under the sway of rival political gangs in which every kind of thuggery and mob violence is used, in which spies and informers are everywhere, and in which the defence forces are corrupted and got at with what is to-day known as fifth column work. Mr. Masefield, of course, can write no story of action in which he does not produce a continued urge of interest. If this novel has a fault it is that it leaves off too soon. There is a grand story in Justinian and Theodora, and this is but a brief prologue to it.

BEWILDERING CARES (Faber and Faber. 7s. 6d.) is a novel which reads as if it were a real—and very human document. Mrs. Winifred Peck writes it in the first person in the character of the wife of a vicar in a manufacturing town in the Midlands. She takes us through a week of her life, and every day and every page is rich in character and atmosphere.

Mrs. Lacely had plenty of worries of her own, what with trying to run a large rambling and unmanageable house on an inadequate income; what with servant and rationing troubles; what with her own personal anxieties (for she had a son in the army) together with a belligerently pacifist curate who would preach sermons which upset those pillars of the church, the local industrialists. If these things were not enough, then there were all sorts and conditions of her parishioners, who brought their troubles, perplexities and bewilderments to her door, all of whom had to be shown tact and given some comfort, and not sent empty away.

The thread of romance runs through the story, is neatly tied up at the end, and one leaves Mrs. Lacely in the sure knowledge that come what may in the form of *blitzkriegs* or anything else, she will still be carrying on with a stout heart and unfailing good humour.

Another domestic novel, but in a different walk of life, is Miss Noel Streatfield's **THE WINTER IS PAST** (Collins. 8s. 6d.). The scene of it is a gracious Georgian house in the Kentish countryside. The time is the first six months of the war.

Levet was a real institution and a tradition in the Laurence family. When Sara found that she had to cope with all the implications of its influence as well as with a determined mother-in-law and a husband who had ideas which took him elsewhere, and also a blacked-out winter and a family of evacuees, she felt that she could truly say that she was up against it. When the winter was past she was able to move into the light, though the struggle had been a sharp and chastening one.

Primarily this is a novel of character, of keenly observed spiritual conflict, and though in relation to the larger issues of the time in which it is set it cannot be said to be very stirring, it is a pleasant novel.

In **THE RAVEN'S WING** (Macmillan. 8s.) Miss Elizabeth Spriggee writes the story of the ill-fated Elizabeth of Austria, from childhood to her violent death. It is a good subject for an historical novel, and one which lends itself to the romantic touch, and both as it concerns Elizabeth and in the background the Habsburg Court, it bears evidence of much research and attention to historical detail.

NOT WHAT IT SEEMS: This ancient and ecclesiastical-looking building at Tattingstone, Suffolk, is not the village church as, at a first glance, it might appear to be, but actually some workers' dwellings built in 1750 by the local squire. It became necessary for him to build some houses for the workers on his estate and as the only available site for their erection was in a direct line with the best view from his home, he had them designed to look like a church, thus in no way marring his outlook. To a careful observer, however, the chimneys and the curtains in the two windows betray the deception; the tower looks very real but is actually only a three-sided shell

Turning from fiction for once, we find worthy of mention **ROMAN PORTRAITS** (George Allen and Unwin. 10s. 6d.). The Phaidon editions have a reputation for dignified artistic books with many excellent plates, and intelligent commentary. This pictorial account of Roman sculpture covering 400 years from the first century B.C. maintains the standard.

The introduction states that Roman artists concerned themselves more with facial expression than body structure. With the Greeks it was the reverse. The observer is struck by the diversity of types in these plates; also the resemblance to the members of another cosmopolitan over-civilised community—the United States of America. The "sensual man in the street" of to-day is basically identical with his past equivalent. Scientific advancement does not radically alter the lust, resentments, and ambitions of the average man.

The last few plates are an anti-climax. Religious convention, a lower standard of art, and a sketchy stolidity mark the latter portraits. The book tails off in the same way as the Roman Empire did. In effect it is a most interesting, statuesque cross-section of an epoch.

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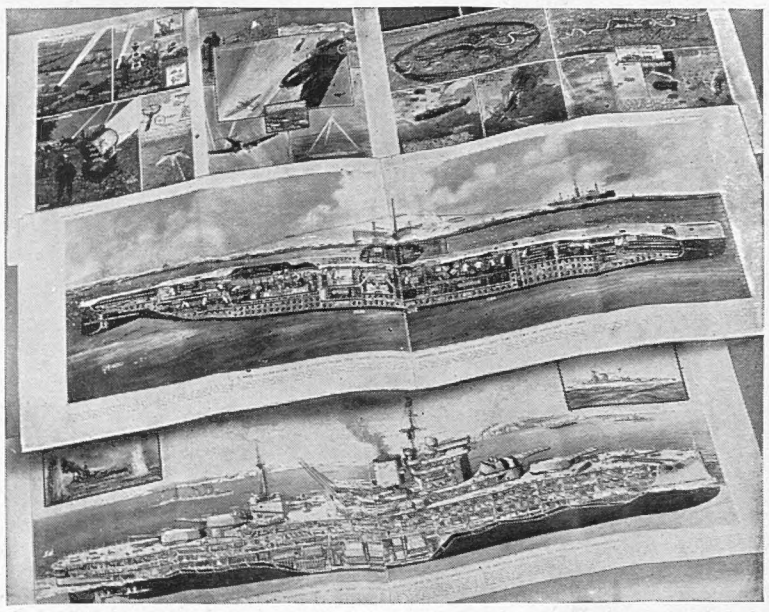

A large number of the informative diagrammatic drawings, chiefly by that well-known artist G. H. Davis, which have been published from time to time in THE ILLUSTRATED LONDON NEWS, are now available in collected form in a special 32-page publication entitled "INSIDE KNOWLEDGE." This will appeal to all who want to know the inner workings of things which the majority of us see only from the outside. Many of these interesting sectional drawings are reproduced as panoramas, EACH MEASURING OVER THREE FEET WIDE. The contents include many fine illustrations of British, French, German, and Italian fighting planes with details of performance, armament, etc. Diagrammatic drawings clearly show how householders can best protect their homes against air raids; and the organisation of A. R. P. services. Searchlights and the balloon barrage are portrayed. Bound in a Leather-finished Cover (Size 20½ ins. × 14½ ins.).

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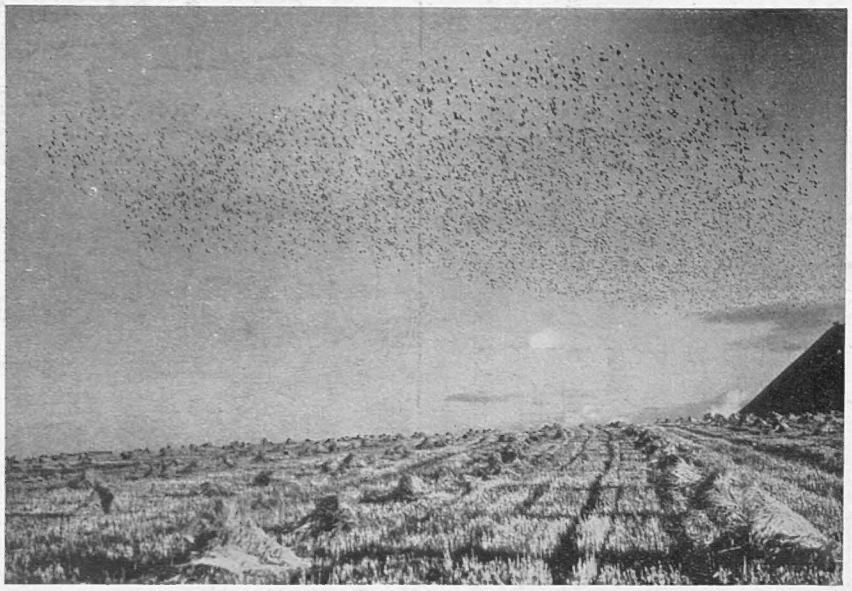
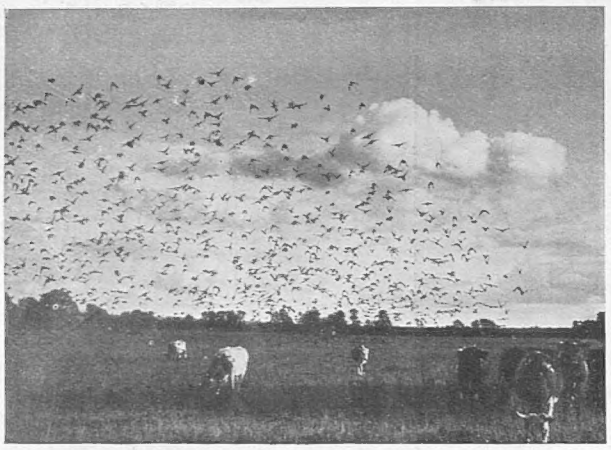


THE INTERNAL MIGRATION OF THE STARLING: This great cloud of starlings is hovering over a cornfield near Edinburgh. These starlings will move southward into England. The starlings native to this island take part in an autumn migration to the south



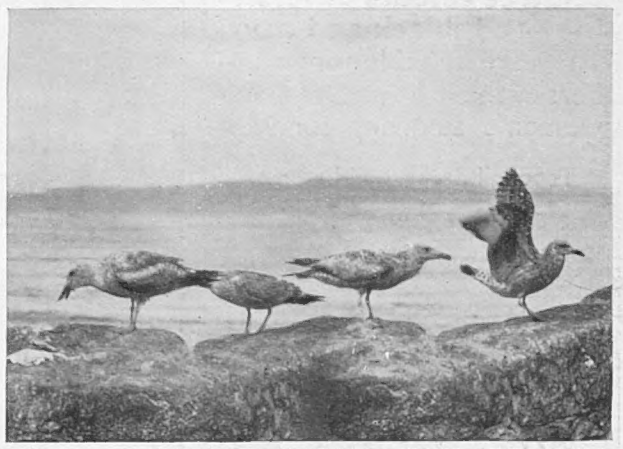
STARLINGS GATHER OVER A SOUTH WARWICK MEADOW: These starlings will probably only move a comparatively short distance, say into Devon or Cornwall

The fascinating problem of bird migration is again brought before us by the movement of the birds on shore, meadow, and hillside. Although the fact of seasonal bird movement was known to the ancients, it is only since about 1890 that exact data concerning the migration of particular types of bird has been ascertained by marking them with a small metal ring. This method of identification enabled the marked birds to be watched for, and some remarkable results were obtained. The pace at which the birds travel was exaggerated at first. A starling travels at between 38 to 49 m.p.h.

A STOLEN HORSE: GULLS AS SIRENS

A CRACK FRENCH RACEHORSE SEIZED BY THE GERMANS: It was announced last week that the Germans have seized among other valuable racehorses and bloodstock Djebel, the winner of the Two Thousand Guineas at Newmarket last November

Several weeks ago an officer stationed on the coast noticed that the gulls on the shore left their positions on the sea wall and rose into the air just before the oncoming of enemy planes had been observed. This has been confirmed by other observers. "While staying at a south coast harbour town I regularly saw the gulls fly inland long before a plane. These coast sentinels, extremely sensitive to sound and atmospheric disturbances, were peace-time barometers for storms; now they watch for the air armada. Geese, too, move inland on the approach of invading bombers."



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In Quest of Good Hotels

By ASHLEY COURTENAY

THE hotel world is ever in a state of evolution, for hotels reflect the age in which they exist—progressive or destructive. Thus we find history reflected in our older inns, stone-paved courtyards, powder closets, snuffers for candles. Coupled with the past we expect to-day the comforts of a modern age. Lock-ups for our cars, private bathrooms to our bedrooms, and an electric light switch by our bedside. To-day, too, we expect something else of our hotels, excepting, of course, the really isolated country ones—we look for adequate air-raid protection, and if safety can be coupled with warmth and comfort, so much the better.

Since the war began I have seen much of what hotel proprietors have done to provide air-raid shelter, and many an original make-shift arrangement has now blossomed forth into such scientific conditions of safety and comfort that one suspects that after the first air raid, visitors might look forward expectantly to the next visitation.

Some hotels are fortunate enough to have natural protection, or solidly built cellars which only require the minimum of adaptation to make them thoroughly safe; others have had to spend considerable sums and, alas for their pockets, such items cannot be added to the visitor's account as a reasonable, but essential, "extra."

Some hotels in less vulnerable districts are better equipped in the matter of air-raid protection than those in more dangerous zones. For instance in Torquay, which has itself been peculiarly free from alarms and excursions, I found evidence of well-thought-out preparedness.

At the Grand Hotel, where there is ever a grand eye for detail, the air-raid shelter is five-star in its provisions; 14-in. walls form an outer case to the main walls of the billiards and games room "suite." There are exits galore, gas-proof curtains, first-aid outfits, and provision for light refreshments. Ventilation is well planned, and coupled with all these details are to be found central heating, rugs, cushions, and comfortable chairs.

Perhaps the squeamish will take the hint when I add that the Grand shelter is protected from the sea as well as from the air, though the chances of sea invasion at Torquay are too slight to be worried about.

At the Torbay Hotel, Torquay, you will find further evidence of clever adaptation for air-raid shelter purposes. Here, taking advantage of the solid rock, which acts as a background to the hotel itself, they have converted a complete suite, so that in case of emergency it can be shut off as a shelter. It will probably strike you as protection de luxe, for it embraces the cocktail bar, the games room and a series of sitting rooms, where one can enjoy comfort in confidence.

Both at the Grand and the Torbay Hotel, Torquay, the air-raid shelter provision is similar to that to be found at the Spa Hotel, Tunbridge Wells, which I described recently.

Hotels in the heart of the country have not the same need to make provision against air attack, for such odd bombs as are dropped are usually jettisoned, and fall without warning; but there are plenty of instances where "ready to wear" cover is available. The underground covered passage-way at Harleyford Manor, near Marlow, for example; the bomb-proof and gas-proof shelter at Sundridge Park Hotel, Bromley; and the labyrinth of underground passages, including a Club bar, at the Devon Hotel, Uplyme, near Lyme Regis.

While we are on the subject of air-raid protection, I would add a word on behalf of hoteliers, and ask for the co-operation of our unthinking public, who are apt to forget that black-out regulations must be adhered to for their safety, as well as for that of the hotel occupants as a whole.

I have heard of many cases where hotel visitors have torn down the black-out curtains provided, or forbidden the maids to draw the blinds in their rooms, till I sometimes feel that a wholesome purge of those who stay too long in any one hotel would be for the good of the hotel itself as well as for the purged ones.

It must be some consolation for the hotel proprietor to know that where he has provided adequate black-out it is the visitor, not the hotel owner, who will be fined if advantage is not taken of the provisions made.

Hotels reflect the age they live in—may the present era of A.R.P. be succeeded, earlier than we dare hope, by a future of peace which will help to obliterate the horrors of the present.

ANSWERS TO CORRESPONDENTS

C. P. W., North Wales.—A very suitable hotel for you, though you will have to put your name on the waiting list, is Thirlstaine Hall. Another place that might suit you is the Castle Hotel, Bangor, or, if you do not mind being off the beaten track, a small hotel called Wern-y-Wylan, Llandonna, Anglesey, is also very nice.

C. M., Portsmouth.—Air-raid sirens are more infrequent in the country than many people suppose; I can suggest with a great deal of confidence the Grand Hotel, Torquay. Alternatively, there is the Redcliffe Hotel, Paignton, or the Ship and Castle at St. Mawes; either of these should be admirable for your purpose.

C. D., Altrincham.—I think the very place for you is the Hydro Hotel, Falmouth, where, in addition to all the usual hotel comforts, they have a very excellent air-raid shelter within the building—and better still you are less likely to have to use it than if you stayed in other districts, for Falmouth, so far, has been lightly treated in the way of night disturbances.

Mr. Ashley Courtenay is always pleased to advise "Sphere" readers of hotels, both large and small, known to him personally. Letters, accompanied by a 2½d. stamp for reply, should be addressed to him, c/o the Editor, THE SPHERE, *32–34, St. Bride Street, London, E.C.4. Personal and telephone inquiries, however, cannot be accepted.*

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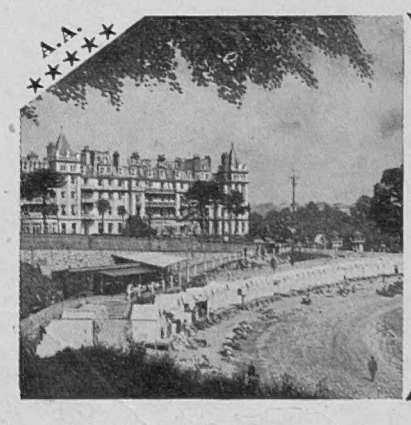

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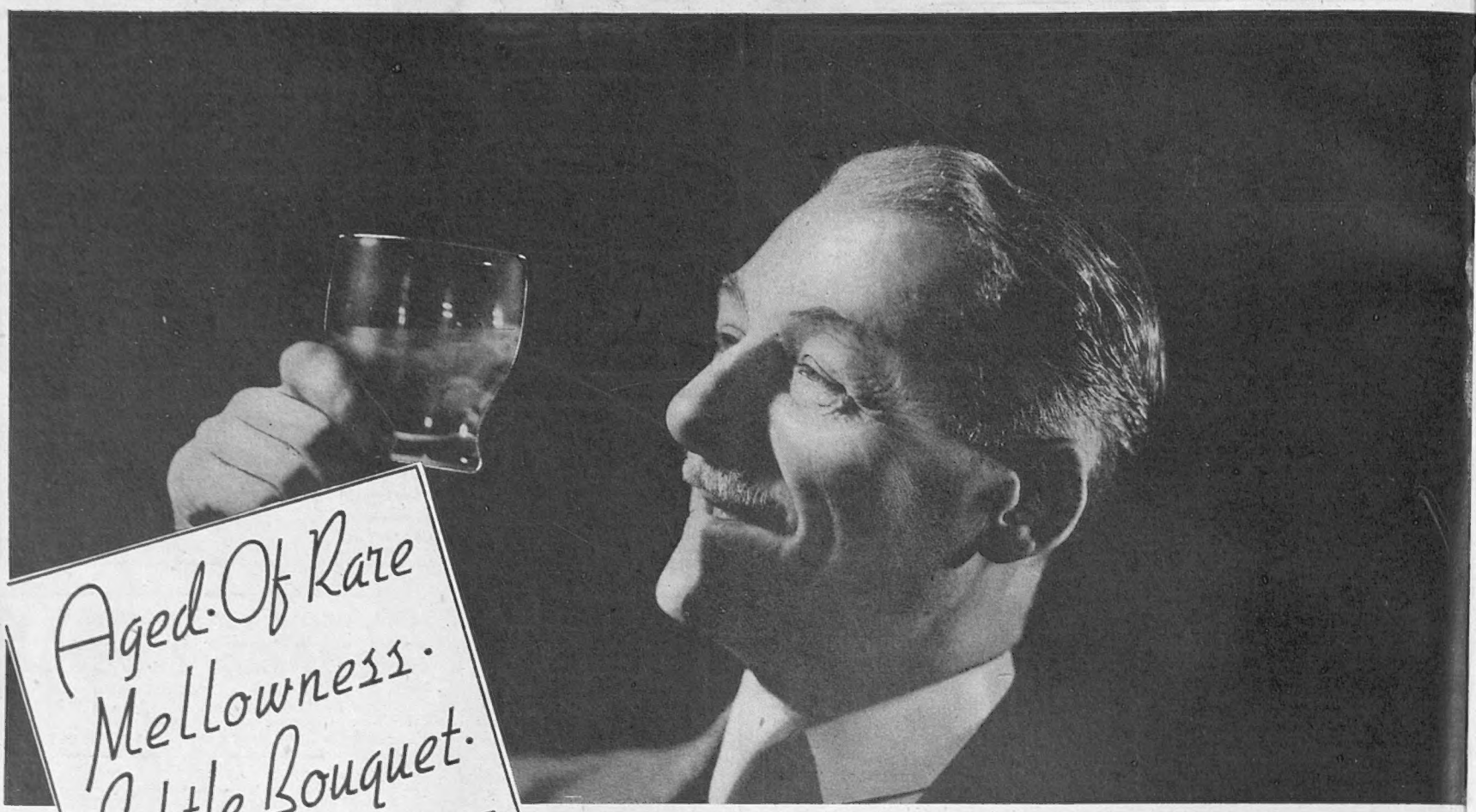

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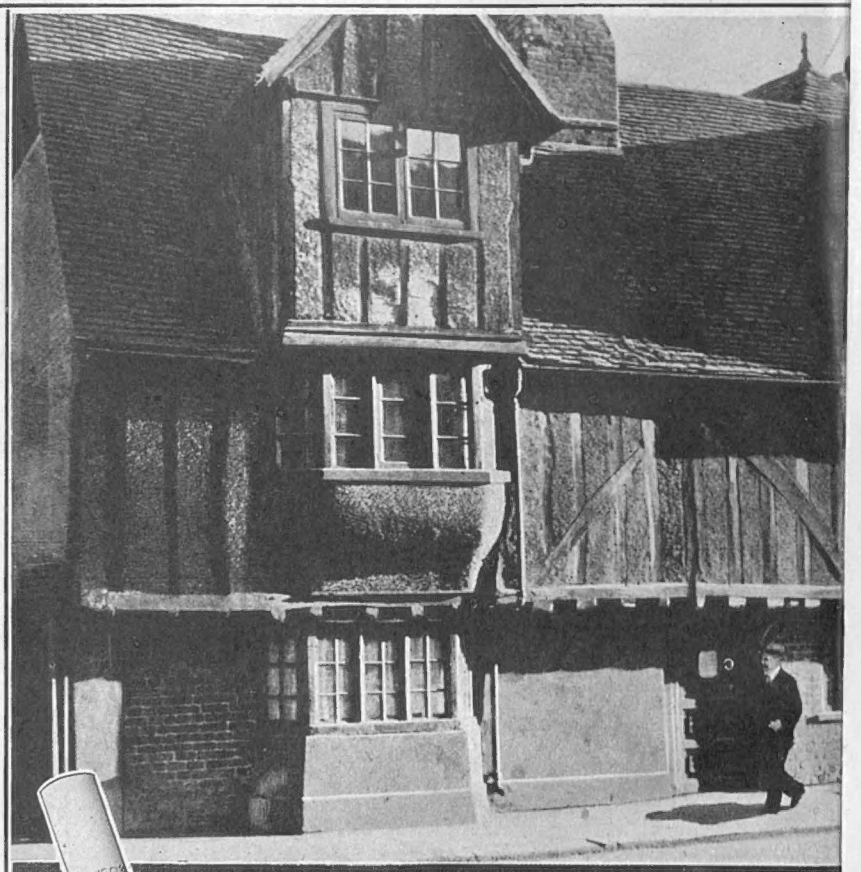

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